MICHIGAN
1950
ENGINEERIN

October 23, 1950

STEEL

The Magazine of Metalworking and Metalproducing

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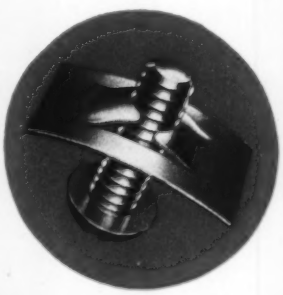
See him ... and Save!

Your Tinnerman representative is one salesman whose business card "means business". He's out to find ways to help you fight rising costs by saving assembly time and dollars.

He's confident there is a Tinnerman "SAVINGS STORY" that can be written about your product.

May he have an opportunity to prove it? Ask him to call soon.



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SHAPES—Round, square, rectangular, oval, streamlined, and special shapes.

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Illustration shows part hydraulically formed to precision tolerances from B&W Welded Stainless Croloy 16-13-2 Tubing (type 316). Concentric ends have same diameter and wall thickness of original tubing. Ask your B&W Tube Representative about your tube forming problems. He may help you uncover economies in selecting, ordering and fabricating.

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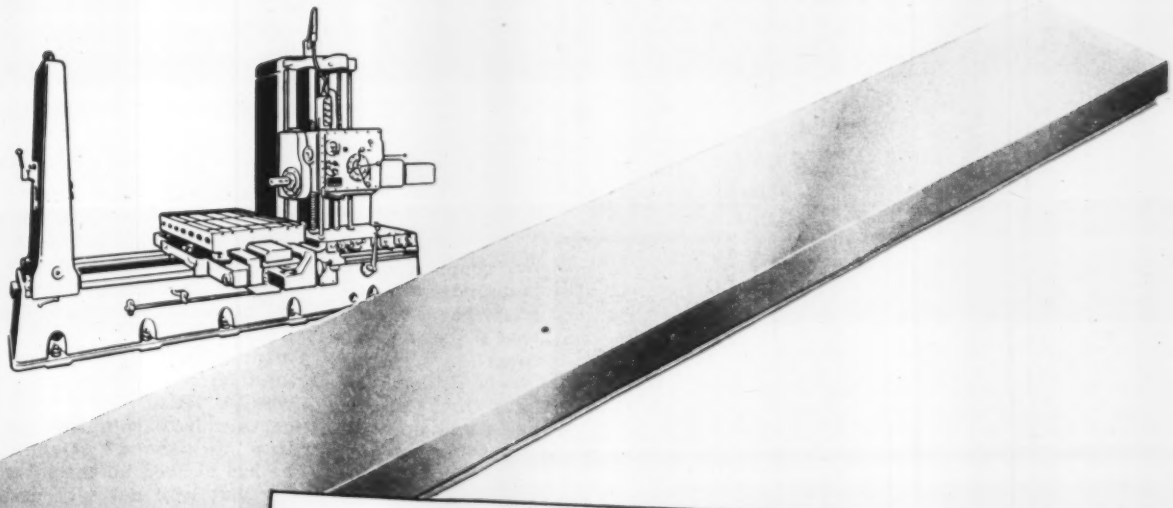
TA-15 3M



WAYS ...ON BEDS, SADDLES AND COLUMNS

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To help maintain high machining accuracy over a longer time, G. & L. Horizontal Boring, Drilling and Milling Machines are now available with heavy-duty, surface hardened ways. This important new Giddings & Lewis construction feature can be applied to the bed, saddle and column on most machine models.

The greater hardness of the new ways also provides a remarkable freedom from *galling,* which often occurs when mating surfaces of bearings have a similar degree of hardness. As a result, G. & L. machines equipped with hardened ways are unusually smooth, accurate and economical in operation.

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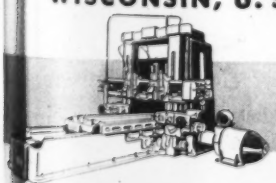
An advanced means of way mounting also contributes to high machining accuracy. This new method serves to minimize transmittal to the ways of torque, strains and shock set up by temperature changes, settling, vibration, etc., from the various machine components.

A tongue on the mounting surface of the machine bed, saddle or runway slip-fits into a channel on the undersurface of the way. For accurate and solid support, however, the way actually rests on hand-scraped shoulders on either side of the tongue. The way is held by double dowel pins inserted into the tongue through the channel.

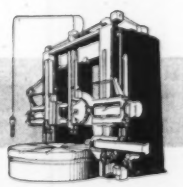
Ask our engineers how G. & L. machines equipped with hardened ways will increase the accuracy of your machined products—and give you years of trouble-free service.

MACHINE TOOL COMPANY

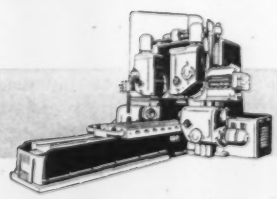
WISCONSIN, U. S. A.



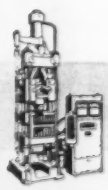
Cincinnati Hypro Double Housing Planer



Cincinnati Hypro Vertical Boring and Turning Mill



Cincinnati Hypro Planer Type Milling Machine



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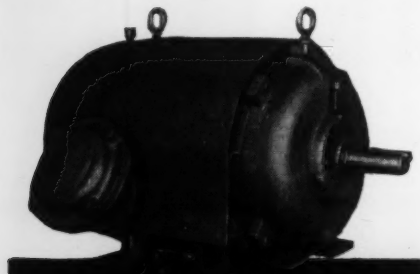

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These special application motors are PRECISION-BUILT for safe operation in hazardous locations and manufactured to the standards of the Underwriters' Laboratories for Class I, Group D or Class II, Group F and G. With the addition of cable outlet, they will also meet the standards of the U. S. Bureau of Mines for use on "permissible" equipment.

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Sales Representatives in Principal Cities

RELIANCE
ELECTRIC AND
ENGINEERING CO.
1081 Ivanhoe Road • Cleveland 10, Ohio

"All Motors are NOT Alike"

Behind the Scenes...

Photo by Karsh

We're impressed by some of the imaginative public relations work that's going on these days. Atlas Steels Ltd., Welland, Ont., Canada, has come up with something unique. Atlas hired Yousuf Karsh — famous photographer of Churchill, Pope Pius, Sibelius and George Bernard Shaw— to photograph some its employees at work in the mills. The accompanying cut shows Karsh setting up a pose. "I tell you," he says, "these steel workers are the peers of those men who are better known."

We note, too, that more companies are realizing the importance of those salesmen who wait in your company's lobby to see you. Such firms as Blow-Knox Co. and Homestead Valve Mfg. Co. are taking steps to make a visitor's call more productive. They are giving booklets that explain the functions of the company, describe its plants and outline its history. You can get lunch at the Homestead cafeteria from noon until 1:30.

Poetry Corner

The editors upstairs got caught in a boner that is neatly pointed out by A. I. Nussbaum of Kew Gardens Hills, N. Y. The difficulty occurred on page 83 of the Sept. 25 issue in connection with a story on self-centering rolls using planar action designed by E. T. Lorig. He's chief of Carnegie-Illinois Steel Corp.'s senior engineering staff. Mr. Nussbaum points out the misspelling of "planar" this way:

There was once working for Mr.
E. Shaner
An ed. who was fond of a spelling
game—or?
He talked planers all day,
So to Mr. Lorig's dismay
Action Planar quite plainly became
Planer.

Dangerous Move

A friend of ours in a Cleveland metalworking company tells of a narrow escape he's just had. During World War II he was a first lieutenant in the Army, but since that war he's been in the highly inactive reserves.

He moved a month ago. In sending out the change-of-address forms the post office thoughtfully provides, he carelessly sent one to the Department of the Army. The very first mail he received at his new address was a letter from the Army accepting his "voluntary offer to return to service." Our man thinks he has cleared up the misunderstanding, but he'll never be certain.

Puzzle Corner

We think that some profound scientific fact may be unearthed from the answers to the poetry puzzle of Oct. 9. Of the first 15 to submit answers, eight were women, the first time in the history of "Puzzle Corner" that women have outnumbered men. Those women — and the men, too—report that the missing words are vile, evil, veil, Levi and live.

The women are: Mina F. Mosher of Jones & Laughlin Steel Corp.; Mrs. Pat Hanley of Crucible Steel Co. of America; Jane Kay of Glenn R. McClintock & Co.; Mary E. Wholey of Lake Terminal Railroad Co.; Mrs. Susie W. Rudd of Gauley Mountain Coal Co.; and Jeannette Lucius, Carol Sherer and Eileen Smith of U. S. Steel Grave Vault Co.

The men are: John Wintersteen of Kaiser Steel Corp.; M. S. Bailey of Machine Products Corp.; Robert G. Docherty of Midwest Piping & Supply Co. Inc.; A. A. Tennison of Tennison Brothers Inc.; Frank L. Barrows of Kelvinator Division of Nash-Kelvinator Corp.; R. C. Lawton of Torrington Co.; and C. I. Gardner of Orinoco Mining Co.

Al Brown, a farmer friend of ours, wants to dig a connecting trench from the upper left corner of a plot 100 feet long by 50 feet wide to the lower right corner. The ground immediately along the extreme left border (100 feet long) is sandy and can be dug at the cost of $1 per foot. The remainder of the plot is rocky, and digging there costs $2 a foot. What arrangement of the trench will cost Brown the least?

Shrdlu

(Editorial Index—page 29)

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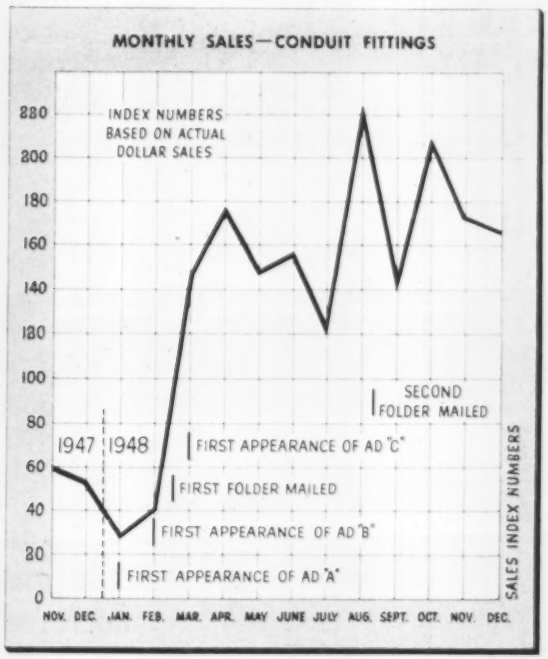
and here's what happened—



THE GRAPH GIVES THE COLD FACTS

During the first two months of the campaign, sales continued on the same steady, low level,

AND THEN—Sales figures jumped well over 300%, to a profitable level! Sales volume was maintained at this new, high level throughout 1948!

Advertising alone was responsible for the tremendous increase in sales! No other sales promotion or merchandising was instituted during the period described. Salesmen followed their usual routine. Fittings were "pushed" neither more nor less than other products. Sales pressure was no greater during 1948 than it was in 1947.

MORAL: Even a little industrial advertising can do wonders with a big sales problem

♦ ♦ ♦

• *This message—one of a series by members of the National Industrial Advertisers Association—is published by* STEEL *to create a wider understanding of industrial advertising and the contribution it is making to American industry. Reprints of this message are available in limited quantities. Address:* STEEL, *Readers Service Dept., Penton Building, Cleveland 13, Ohio.*

Industrial Advertising Council of Pittsburgh

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Write for further information and examples of applications in the field that interests you most.

Ask for Bulletin 96.

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LETTERS
TO THE EDITORS

Fast Reply, Too

We are interested in having pertinent information regarding a new fast-acting case hardening compound, reported by Doughty Laboratories, New York, which you mention in your issue of Oct. 9, page 79.

W. M. Russell, President
Delo Screw Products Co., Delaware, O.

● *Get complete information from Doughty Laboratories, 299 Madison Ave., New York 17, N. Y.*

Interest in Ordnance

Some time ago I came across a publication on ordnance by the Penton Publishing Co. This copy was in the United States Naval Academy Library. Since I am very much interested in ordnance, especially small arms, I was wondering if any or all of the series are available at present.

Frederick M. Fleeman, Midshipman, USN
U. S. Naval Academy, Annapolis, Md.

● *Three series of articles appearing in* STEEL *in 1941 were each reprinted in booklet form: Modern Small Arms, Modern Shell Production and Modern Gun Production. Of these, a few copies of the first and last are still available at $1 each.*

Booked Up Tight

We are interested in receiving the names of steel mills converting steel from ingots and slabs to sheet steel. I would appreciate any assistance you can give me in this connection.

Louis A. Zuch
Near East International Inc., New York, N. Y.

● *Rolling mills doing conversion work of this type are fully booked well into 1951. Any rolling mill that has an excess of rolling capacity over ingot capacity is a prospect for conversion tonnage, but we know of no mill accepting such business at this time.*

Back Reference

On Oct. 19, 1949, the *Telegram* of this city had a write up about the experiments having been made by the Soderfors Steel Works of Sweden in connection with direct reduction of iron ore. The article referred to the fact that the news was published in STEEL. Can you tell me in which issue it appeared?

R. E. Holliday
C. R. Fox-Revett, Toronto, Ontario

● *The article, "Wiberg-Soderfors Method for the Manufacture of Sponge Iron," appeared in the Sept. 19, 1949, issue.*

Steel Finances Draw Attention

I shall be obliged if you can send me a copy of the page from April 24 issue of your magazine, "Financial Analysis of the Steel Industry for 1949".

P. E. Mehta
Heavy Indian Industries, Bombay, India

● *A copy is being forwarded. If others are interested, a limited number are still available.*

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CCA

STEEL

The Magazine of Metalworking and Metalproducing

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or cut to actual working
dimensions
from
WAREHOUSE STOCKS

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We're all in the same boat . . . warehouses and users alike. Yet, we at Reliance have been managing so far to help most of our customers keep going. And here's how;

First—we try to spread our inventories around among our customers as equitably as we know how, and for the greatest good of the greatest number.

Secondly—we try to *job-fit* material that *is* available to the needs of individual customers, and so make limited stocks go further, helping more users.

We're no miracle workers but we'll do our best to help you, inventory permitting.

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October 23, 1950

Freedom at Stake

Two weeks from tomorrow Ohio voters will ballot for a United States senator. If Robert A. Taft is re-elected the unusual campaign that is being waged against him soon will be forgotten. If he is defeated, this campaign will become the pattern for pressure politics which could easily plunge this nation into a labor government more socialistic in its ambitions than is its counterpart in Britain today.

Every industrialist—regardless of party affiliation—should consider this Ohio senatorial race from a non-partisan standpoint. Judge it on the basis of what is most wholesome for the nation. Here is what you will find:

About 95 per cent of the active campaigning against Taft is being conducted not by the opposition party but by a coterie of labor unions of which the Political Action Committee of CIO is the spearhead. Their campaign is based upon the crudest possible appeal to class prejudice and upon outright lies and distortion of facts conforming closely to Hitler-Stalin techniques.

Most of the literature employed by PAC damns Taft because he happened to be born into a well-to-do family and extols his opponent because he was born in moderate circumstances and has a large family of three boys and five girls. Whenever possible, the union campaign literature tries to make capital by linking Taft's name with those of eminent industrial executives—the implication being that anyone who has even a nodding acquaintance with successful businessmen should be suspect. Throughout the campaign PAC — while smearing the Taft-Hartley Act as a "slave labor" measure—studiously refrains from discussing it in detail.

A significant tip-off as to the mood of some unionists in this campaign was sprung by a local union leader who, irked by the solid stand of newspaper editorials against union campaign tactics, blurted out this threat: "Some day we'll be in a position to tell the press what it can and cannot print."

What we are witnessing in Ohio today is a ruthless drive for power by a minority group in which the weapons of class hatred and outright lies are being substituted for the customary American rule of reason. If PAC wins, every state in the country will share with Ohio the grave problem of making a last ditch stand against socialism.

* * *

DEMAND SNOWBALLING: In this period of adjustment to what appears to be a garrison-state economy, it is impossible for the management of a company to count with certainty upon any government plan or commitment as now outlined. There are bound to be many changes as the program of preparedness develops. The best one can do is to be guided by probabilities.

One probability that has a good chance of crystallizing into material fact is that many direct or indirect requirements of the military thus far outlined by Washington have been understated. Already National Production Authority is revising its earlier estimates upward. Their refined figures for the freight car program, including maintenance and repair of existing cars, call for 300,000 tons of steel a month, of which 75 to 80 per cent will be plates. Seven lake vessels will require 50,000 tons of steel, 80 per cent of it plates. A proposed new fleet of barges, tugs and tankers for inland waterways also will require a sizable tonnage of plates.

Beyond these fairly tangible programs are possibilities for a step up in motor truck out-

(OVER)

put; steel for drilling rigs, pipelines, tankers and refineries in an expansion of petroleum producing capacity; and a marked expansion in the nation's electric power generating capacity.

Activity in any one of these projects will fan out in all directions in the metalworking industries. New peaks in national output are almost certain to be scaled." —p. 37

* * *

20 PER CENT A YEAR: President Truman has designated W. Stuart Symington, chairman of the National Security Resources Board, to act as the agent who will certify which industrial facilities "essential" to the rearmament program are entitled to accelerated depreciation under the Revenue Act of 1950. Any facility completed after Dec. 31, 1949, thus certified can be depreciated at the rate of 20 per cent a year for a five-year period.

A company seeking certification should apply to the department or agency which has jurisdiction over its activity. If your facilities have to do with petroleum, gas, solid fuels or electric power, apply to the Interior Department; with farm equipment, apply to Department of Agriculture; with transportation, to Interstate Commerce Commission; all other materials and facilities, to Department of Commerce, except that the Defense Department will make recommendations on facilities turning out end products such as tanks and planes.

One of these departments will consider your application and submit it to NSRB for certification. —p. 43

* * *

GRINDING ON UPGRADE: Production of the abrasive grinding and cutting wheel industry will total about $100 million in 1950. This is more than three and a third times the volume of 1939 and it has been accomplished with an average increase of only 24 per cent in prices during the period.

Major users of the industry's product are the automobile, foundry, and steel industries. Partly because of heavy consumption by automotive and parts manufacturers, more than half of the output of grinding wheels goes to midwest markets. New uses for grinding wheels are being found daily. It is estimated that more new products and applications have been developed by the industry in the last five years than in the preceding 30.

The industry consists of about 52 companies, 32 of which produce 99 per cent of the total output. The remaining 20 or so companies are engaged chiefly in making specialty products. —p. 49

* * *

83 PER CENT FERROUS: General Motors Research Laboratories have made an accurate engineering breakdown of the ingredients of a typical 1950 four-door sedan. Of the car weight of 3824 pounds, steel accounts for 2556.29 pounds. Next comes gray iron with 521.15 pounds. Rubber compounds is third with 205.63 pounds. Fourth is malleable iron with 99.60 pounds. Thus the three ferrous metals account for 3176.04 pounds, or 83 per cent of the total.

Among the dominant nonferrous metals in an automobile are zinc and zinc alloys, 66.06 pounds; lead and lead alloys, 30.39 pounds; copper, 25.99 pounds; copper alloy, 15.61 pounds; and aluminum and aluminum alloys, 11.39 pounds.

There is much speculation in motordom as to how much "austerity" will be introduced into 1951 models. Apparently this will not be determined until after the first of the new year. However, even a marked entry into "austerity" probably would change the engineering breakdown of ingredients only moderately. —p. 51

* * *

DOING THE IMPOSSIBLE: As the metalworking industries become more and more involved in preparedness work, there will be times when hard-pressed operating men will feel like throwing up their hands and saying, "We just can't do what you are asking us to do."

This is not new. It happened frequently in World War II. It was refreshing to hear David Ayr of Hendey Machine Co. remind machine tool builders at their recent convention that they first told Washington they couldn't run their plants around the clock, that they couldn't employ women effectively, that they couldn't afford to lose men to the draft and that they couldn't expand their plants to the incredible extent requested.

Yet machine tool builders did all of these "impossible" things and did them magnificently. This time the cue will be to beat Washington to the draw—show officialdom how the impossible can and should be done. —p. 71

E. L. Shaner

EDITOR-IN-CHIEF

News Summary

UNDERESTIMATED—Going up are government estimates for defense steel needs; going down are the hopes of non-rated steel consumers for an easing of the shortage (p. 37). Plate requirements, particularly, were underestimated. Big freight car, inland water carrier and motor truck building programs will take a larger bite from available supplies than first thought. A secondary effect may be felt by strip users because some steel strip mills will probably have to be converted to plates to meet the rising demand.

YOU CAN'T DO THAT—Allegheny Ludlum Steel Corp.'s chairman, Hiland G. Batcheller, has a remedy for the steel shortage, but the government lawyers would probably call it "collusion" (p. 40). He suggests that scarcities could be "considerably alleviated" if the industry could put a relatively small tonnage of steel in a pool each year and take industry-wide action to distribute it in hard hit areas.

YOU CAN DO THIS—The long-range outlook for steel is better because steel industry expansion programs are becoming more ambitious by the week (p. 39). But some government officials continue to complain that the industry is dragging its feet. Armco, Youngstown Sheet & Tube, Keystone and Washburn are the latest to announce expansions that will help the industry to boost its capacity to 110 million tons by the end of 1952.

EXPANSION SPUR—Influencing the spurt in expansion plans is the five-year amortization provision in the new tax law (p. 43). NSRB Chairman W. Stuart Symington has been granted the power to say what facilities are eligible for accelerated depreciation. The provision permits a company to write off defense facilities in five years if they were completed after Dec. 31, 1949, and if Mr. Symington approves.

UP AND UP—Even without expansions, metalworking is turning out goods at a phenomenal rate (pp. 54-57). Last week steel mills operated at 102 per cent of theoretical capacity and turned out 1,967,300 tons of ingots for an alltime peak. U. S. plants have already topped the record 6,258,198 passenger cars and trucks built last year. Federal Reserve Board estimates its industrial production index in September hit 213 per cent of the 1935-1939 average. Non-farm employment rose to 45.5 million in mid-September, the highest level in history. The net working capital of U. S. corporations rose to $73.8 billion at the end of the second quarter, another record.

SMOOTH GOING—Sharing in industry's accelerated production pace are abrasive grinding and cutting wheel manufacturers (p. 49). They'll produce to the tune of $100 million or more in 1950, three and a third times what they turned out in 1939. More new products and applications have been developed by the industry in the last five years than in the 30 preceding.

ROUGH JOB—The government is going to try to figure allocations requirements on a scientific basis (p. 44). To do so, the Commerce Department's Small Business Division will supervise state and local agencies in conducting a business survey. Expect to answer these questions soon: What products are you now making? What's your capacity? What raw materials do you need? What—so far as you know—can you produce for war?

HERE AND THERE IN INDUSTRY—Warehouses and dealers received 1,224,000 tons of steel in August for an alltime high (p. 38) . . . The Defense Transport Administration says at least 227,400 new freight cars must be built by June 30, 1952, to meet defense requirements (p. 38) . . . European nations concentrate on more intra-European trade, more dealings with Latin America and more dollar business as their exports rise 20 per cent above the 1938 level (p. 47) . . . U. S. Steel Corp. is about ready to proceed with development of iron ore deposits in Venezuela, and Bethlehem Steel Co. will begin volume ore shipments from the country soon (p. 48) . . . How much "austerity" will be noticeable in 1951 auto models won't be determined until after the first of the year; critical items seem assured until Dec. 31 (p. 51).

high strength-to-weight ratio does the job

Inland HI-STEEL

High strength, low alloy Inland HI-STEEL has nearly twice the yield strength of ordinary structural-grade carbon steel! It permits weight reductions up to 25% of total unit weight and at the same time affords greater resistance to abrasion and atmospheric corrosion.

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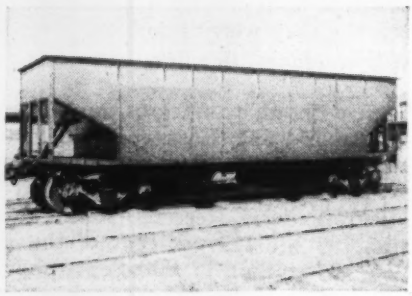
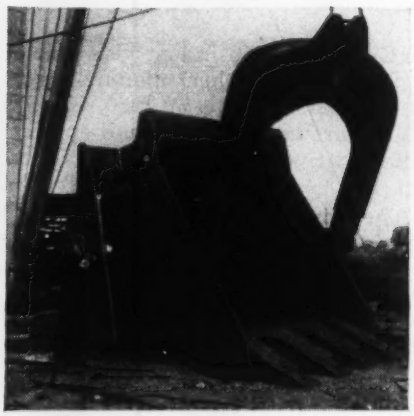
Result: Operating costs of mobile equipment fabricated of Inland HI-STEEL are greatly reduced.



LIGHTER!

Result: Payloads of mobile equipment fabricated of Inland HI-STEEL can be greatly increased.



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Result: Higher strength permits use of lighter sections. Three tons of HI-STEEL will usually produce the same number of units requiring four tons of ordinary structural-grade carbon steel.

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STEEL
A PENTON PUBLICATION

Mills push to keep up with demand as . . .

Defense Needs Rise for Plates

Non-rated plate consumers will suffer when NPA programs start early in 1951. A secondary effect will be felt by strip users as mills convert to plates

BAD NEWS for non-rated plate consumers developed when the NPA's Iron & Steel Division went to work on the Defense Transport Administration's program for increasing transportation facilities.

In addition to the freight carbuilding program, on which formal request is before NPA, several new programs are taking form that will need steel plate. They all may be operating soon after next Jan. 1. A secondary effect will be felt by non-rated strip and sheet users because some strip mills may have to convert to plates to meet the heavy demand.

Up and Up—Rejiggering of statistics indicates that more steel then first estimated will be needed for the freight car program. On the basis of average monthly production of 10,000 new freight cars, and allowing for "MRO" (maintenance, repair, and operating) requirements, that one steel need will come to about 300,000 tons a month. Of that total some 75 to 80 per cent will be plates.

Now being figured by the Defense Transport Administration are inland waterway requirements. One phase of the program calls for seven lake iron ore carriers that will require an estimated 50,000 tons of steel, of which 80 per cent will be plates.

Growing Pains—Another program, at first rated as a small one, now gives promise of growing to substantial size. It's for inland waterway craft—including barges, tugs, tankers. These boats also will be built largely of plates.

The Defense Transport Administration's survey indicates a deficiency in the number of motor trucks that would be needed to meet transportation needs under a condition of full war mobilization. There will be a motor truck building program, but its size is still to be determined.

More Fingers in the Pie—The first quarter outlook for non-rated steel consumers is worsened by rumblings from Interior Department's Minerals & Energy Administration, whose Petroleum Administration for Defense is making up a bill of materials to implement needed expansion in petroleum production. It includes steel for drilling rigs, pipelines, tankers and refineries. The Solid Fuels Agency is making up a list of mine cars and various types of mining equipment, together with an estimate of the steel to be required for constructing the equipment and that needed for "MRO" purposes. Those programs will make heavy inroads on the plate supply.

Another Minerals and Energy Administration program will call for substantial expansion in the nation's electric power generating capacity. It will take a little longer to swing this one into motion, for legislation by Congress will be necessary to implement it.

Paternal Expansion—A fourth Minerals and Energy Administration program will deal with expansion in production of strategic and critical minerals. The program, in the hands of the Metals & Minerals Agency, of which Dr. James Boyd is director, is authorized to encourage production through government direct or guaranteed loans; government purchases of strategic and critical minerals at premium prices; and government defrayal, up to 50 per cent, of excessive costs of operating marginal mines. A large tonnage of steel will be needed for this program—for machinery, trucks, bridge and road construction, "MRO" requirements, etc.

The Metals & Minerals Agency's program is being developed in accordance with stockpiling and current consumption needs as certified by the Department of Defense. The minerals being studied include ores of copper, iron, antimony, lead, zinc, aluminum, titanium, manganese and various ferroalloys. Look for a drive to get out more tungsten and molybdenum to insure adequate supply of cutting tools in a full emergency. Other minerals that are being studied are mercury, asbestos, lithium and graphite.

Lots of Power—The Metals & Minerals Agency is assigned the control of: Nonferrous metals and minerals as raw materials and through the processes of smelting and refining; ferroalloys as raw materials and through their smelting and refining; and ferrous metals and minerals as raw materials up to but not including the blast furnace.

The Metals & Minerals Agency's industry advisory committee is the National Minerals Advisory Council, which for two years has been functioning in an advisory capacity to the Interior Department. The council already has a substantial number of industry committees, representing all segments of the metals industries, and will organize others as needed. The National Minerals Advisory Council has its headquarters at 1757 K Street N. W., Washington, and James

INSPECT—ARMS! Three U. S. Army Ordnance inspectors examine construction, workmanship and materials, inside and out, during the final inspection in the manufacture of 57-millimeter recoilless rifles at Firestone Tire & Rubber Co. K. I. Moore, left, inserts a dummy shell to check for specified firing pin protrusion and mechanical extraction of empty case. Inspector George P. Gee, center, operates a star gage to measure the lands and grooves of the rifling inside the barrel, and inspector Charles Beatty, right, uses a borescope to check the inside of the barrel for defects. A production record was set by Firestone by producing 300 of these needed weapons in 30 days to meet Army needs for the weapon in Korea

A. White is its executive secretary.

Advice from Industry—The council already has informed the Metals & Minerals Agency that the latter's powers under the Defense Production Act are not sufficient to put real steam behind a minerals expansion program. The council recommends that: Raw materials not processed beyond the first marketable stage should be exempt from renegotiation, as in World War II; the minerals industry must be given fair excess production tax credits if an excess profits tax is voted by Congress.

Another claimant agency now is estimating the steel requirements on which it will request a DO rating.

That's the Atomic Energy Commission which will spend $825,000,000 between now and June 30, 1951, on new construction. About $500 million of this total will go into miscellaneous construction, particularly on the large new reactor plant in Idaho, and most of the rest on beginning of work on the projected hydrogen bomb development plant.

At Least 227,400 Cars Needed

The Defense Transport Administration says at least 227,400 new freight cars must be built by June 30, 1952, to meet defense requirements.

James K. Knudson, administrator of the new agency, says he approves of the present program for a minimum of 10,000 new cars a month starting next year, but this will "barely suffice" to meet defense needs even under the most favorable conditions. He says railroads will have to be prepared to handle about 15 per cent more traffic in 1952 than in the peak postwar year of 1947. Consequently, the railroads may soon need more than 10,000 new cars a month.

Car orders now on builders' books are a little over 100,000 units. September output was over 5000.

Car Uses Less Steel

Pressed Steel Car Co. Inc. has designed a new freight car that uses 20 tons less of steel than the conventional unit.

Although the steel savings arise almost as a by-product in Pressed Steel Car's design for a combination refrigerator-box car, they may become the unit's major selling point as the nation's railroads strive to expand their freight fleets in the face of a steel shortage.

Electronics Help—The car builder's Unicel is constructed of cellular laminated plywood molded and bonded under electronic energy into a single unit structure. Built in is a cold wall similar to that in a modern household refrigerator. Frigidaire mechanical refrigerating unit is powered by diesel fuel enroute and by electricity at sidings and warehouses.

A rubber sleeve mounted to the car's end-couplers cushions and absorbs road shocks. The interior has rounded corners and flush interior door construction to make cleaning easier. The only steel used in construction of the Unicel is in the undertruck, the door frames and in various other parts such as the draft gear and coupling device with which the car is fitted.

More Steel Is Not Enough

Warehouses and dealers received more steel during August than ever before in a month, American Iron & Steel Institute reports. They got nearly 1,224,000 net tons, a more than 150,000 ton increase over July receipts. In 1950's first eight months they received 8,693,000 tons, also a record. Their receipts in the first eight months were 19 per cent of total shipments, compared with 17.8 per cent in the like 1949 period.

Despite larger receipts in this period, the warehouses find their position a not too happy one. Warehousemen contend their situation has worsened since August due to heavy customer demands and lower shipments from producers. Stocks on hand are way down (STEEL, Oct. 9, p. 55) and small consumers' operations are jeopardized, they say.

A proposed plan for maintaining steel inventories to meet needs of small business firms was approved unanimously last week by the Industrial Steel Products Warehouse Advisory Committee of the National Production Authority. The committee met with Director D. B. Carson and other officials of the NPA Iron and Steel Division to consider the plan which will be issued as a regulation when final details are worked out.

It provides for establishment of:

1. Monthly warehouse allotments by steel producers, in proportion to available civilian supply, and based on their shipments during the first half of 1950.

2. Ceilings, both in terms of total inventory and individual products, on DO defense orders that warehouses may be required to accept. Aim here is to equitably distribute these orders among warehouses and reduce possible disruption to firms primarily dependent on warehouses for their needs.

Automotive industry's steel receipts in August totaled 1,234,800 tons for 19.8 per cent of the total while in the first seven months they got 21.1 per cent of steel shipped by producers. Ordnance and other direct military uses took 28,000 tons in August, the highest total since 1945.

More Steel Capacity Expansions Launched

Armco, Keystone, Youngstown tell part they will play in adding nearly 10 million tons of capacity to country's total by end of 1952

MORE steel for both military and civilian uses is assured by new expansion programs being started by producers.

They are part of the industry's program to raise this country's ingot capacity to 110 million tons by the end of 1952. They include primary steel capacity, blast furnaces, processing and finishing equipment.

Armco Steel Corp. last week started production at its new $12 million open-hearth plant at Middletown, O. On the same day Chairman Charles R. Hook announced a new $35 million expansion program.

Keystone Steel & Wire will increase its steelmaking capacity by 33 per cent by building a new open-hearth furnace.

Wanted: Depreciation Reform—Youngstown Sheet & Tube Co. will spend about $9 million on improvements at its Youngstown district plants

The company plans to spend $100 million for needed expansions and improvements. This program, says Chairman Frank Purnell, is contingent on an accelerated depreciation allowance.

These and other expansions recently announced or about to be announced are impressing steel consumers and a good many government officials.

Commerce Secretary Charles Sawyer terms it "an encouraging indication of the willingness of the industry to forge ahead."

More, More—But sour notes continue to be sounded by some government officials who long have advocated that the government build steel plants.

C. Girard Davidson, an assistant interior secretary, told the Indiana Independent Petroleum Association at Indianapolis that the country will need 125 to 130 million tons of steel capacity by 1953 to meet normal civilian requirements and estimated military demand. Mr. Davidson criticizes the steel industry's expansion program as inadequate.

Armco Forges Ahead

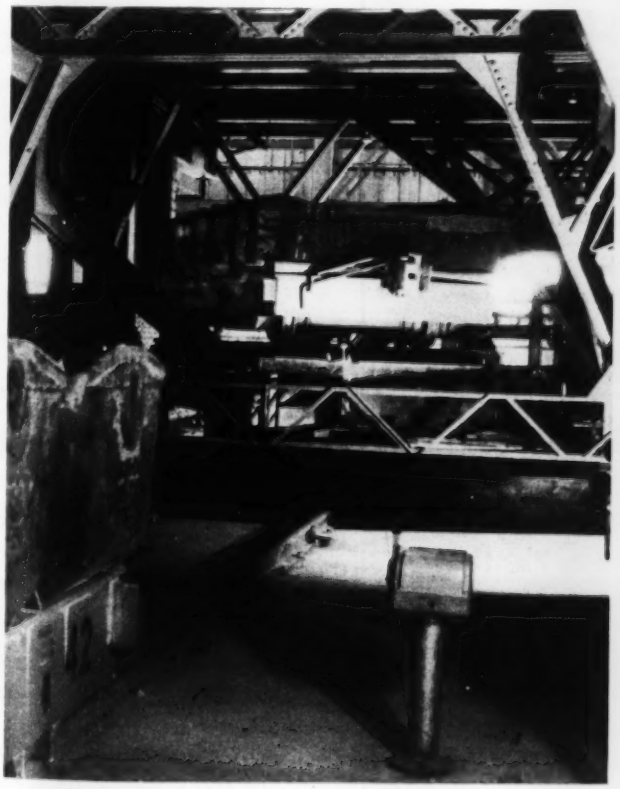
ARMCO Steel Corp. will build a blast furnace and coke ovens, enlarge its soaking pits and make other improvements at its East Works in Middletown, O. The project will cost $35 million and will provide 600 new jobs.

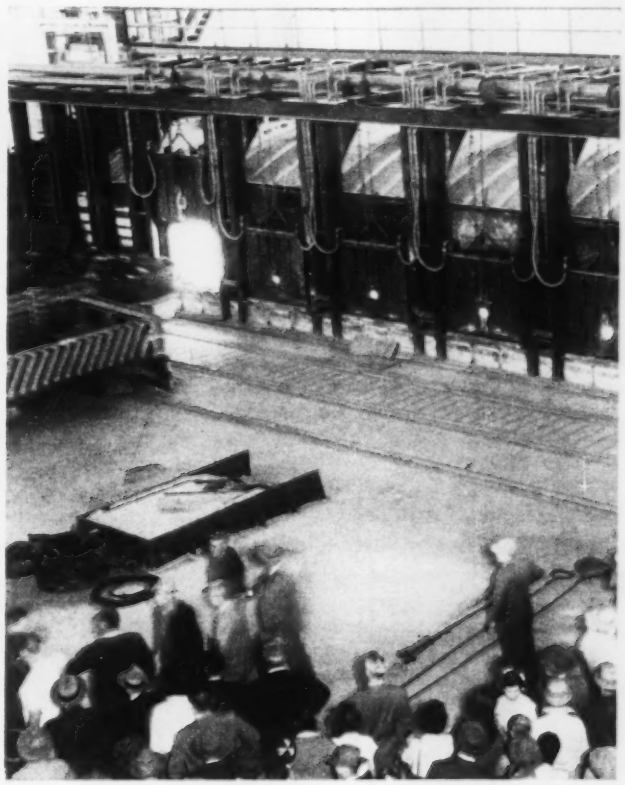
The announcement was made as Armco started the first furnace in its new $12 million open-hearth plant, adding 400,000 tons of steel ingots to present annual capacity.

Sheffield Adds Furnaces—Armco's subsidiary, Sheffield Steel Corp., is building a large electric furnace at its Houston plant and will soon build either a new open hearth or electric furnace at its Kansas City plant.

During the next two years, Armco will increase its capacity by 1,017,000 tons, or by about 27 per cent, to a total of 4,810,000. This will be the most rapid expansion in its history.

Where?—Principal places where increases in capacity will be made





TRAFFIC CONTROL: Armco's new open-hearth plant is attracting national interest because of its new method of charging furnaces. A system of hydraulic hoists elevates cars or buggies filled with scrap metal and other raw materials from the scrap yard level up to position in front of the furnaces. Standard practice is to move long lines of scrap-laden buggies to the furnaces on railroad tracks, frequently resulting in traffic congestion and slowing production. In the photograph on the left a scrap buggy is pictured halfway between the ground and the charging floor. In the photograph on the right is seen a small part of the crowd that watched the first furnace in the new open-hearth plant being charged. The $12-million project will add 400,000 tons to Armco's annual steel capacity

are 580,000 tons at Middletown; 150,000 tons at Houston; 150,000 tons at Kansas City; and 137,000 tons at Ashland, Ky., where a modernization program was announced a few weeks ago.

The new Armco blast furnace, one of the largest in the world, will have a capacity to produce 1500 tons of pig iron per day. An ore storage yard, with car dumper, will be constructed, capable of holding 1 million tons of ore.

Approximately 75 by - products coke ovens will be built as well as a by-product plant to recover coal tar, nitrogen, and other valuable chemicals.

Still Growing at 50

YOUNGSTOWN Sheet & Tube Co. will spend between $8 and $9 million for improvements to its Youngstown district plants, according to Chairman Frank Purnell.

The company last week observed its 50th anniversary by holding open house at its plants.

In announcing the program, Mr. Purnell said the company has tentative plans to spend $100 million on needed expansion and improvements. This program, he says, is contingent on an accelerated depreciation allowance.

Mr. Purnell contends that private capital cannot expect to make a profit by building entirely new steel capacity at present prices. He estimates that prices, with no further rise in steelmaking costs, would have to increase $15 to $20 a ton to make entirely new steel plants profitable.

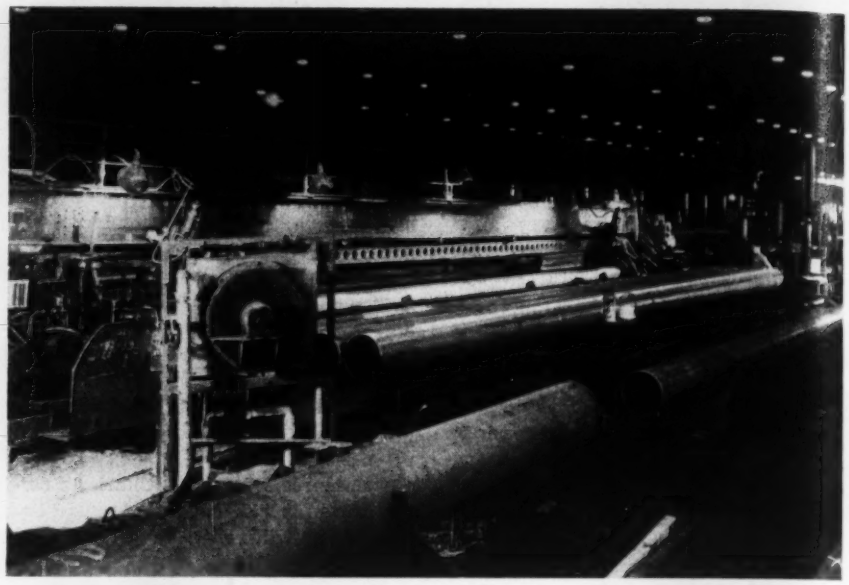
The Youngstown improvements include changes in the electric weld pipe mill, improvements to coke ovens, new cranes and larger ladles at the Campbell Works. Ingot capacity at the Campbell Works would be increased by 75,000 to 100,000 tons annually.

Keystone Adds Furnace

KEYSTONE Steel & Wire Co. has begun the construction of a fourth open-hearth steel furnace which will increase the company's steel ingot capacity by more than 100,000 tons to 425,000 tons annually. The new furnace, to be completed within the course of the next year, will cost in excess of $1.5 million.

The company's present three open-hearth furnaces, built in 1917, have a rated annual capacity of 325,000 net tons of steel ingots but in the fiscal year ended June 30, 1950, produced 337,129 tons. In addition the company found it necessary to purchase 22,130 tons from other producers to meet the requirements of its own plants as well as those of subsidiaries.

The steel fabricating capacity of the company and its subsidiaries has exceeded Keystone's steel making capacity for several years past, President R. E. Sommer says.



BRIER HILL WORKS: Here is the hydrostatic tester in the electric weld mill of Youngstown Sheet & Tube Co.'s Brier Hill Works. Over 12,000 persons saw this and other installations during the company's 50th Anniversary Open House

More Basic Capacity Coming

Washburn Wire Co., Phillipsdale, R. I., is constructing a new open hearth of 36,000 tons annual capacity that will be in operation about Jan. 1, 1951. The additional open hearth will give the company an annual capacity of about 92,000 tons. Employment will be increased to 750. Washburn Wire Co., with finishing capacity in New York city, makes high carbon specialties, notably valve spring wire, clock and motor spring stock, music wire, razor blade steel, roller bearing and other specialties. The company is also considering a long-range expansion program that would eventually bring its annual capacity to 140,000 tons.

Brainard Leasing Warco Plant

Brainard Steel Co., Warren, O., wholly owned subsidiary of Sharon Steel Corp., Sharon, Pa., is leasing the $7-million government-owned Warco plant at Warren, O. The plant formerly was operated by Federal Machine & Welder Co. and includes 386,000 square feet of floor space.

Brainard says it will make it possible to move some of its operations from Sharon's Farrell works. The program is part of Sharon's $49-million expansion program. Brainard produces cold-rolled strip steel, welded tubing and steel strapping.

Steel Shortage Remedy

Batcheller proposes a steel pool, but the government would probably call the cure "collusion"

THE STEEL shortage could be "considerably alleviated," but government lawyers would call the remedy "collusion," says Hiland G. Batcheller, chairman of Allegheny Ludlum Steel Corp.

In speaking before the Chicago Chapter of the Purchasing Agents' Association, Mr. Batcheller spoke in the vein followed by U. S. Steel Corp. President Ben Fairless and other steel executives who got tired of the industry's whipping-boy role in Congressional steel investigations last spring and summer.

Co-operative Action—"If the industry could put a relatively small tonnage of steel in a pool each year," says Mr. Batcheller, "and take industry-wide action to distribute it in areas where there are critical local shortages, steel supply injustices would be wiped out and everybody would be happy—except government lawyers. They would call it collusion."

He says you can't cure a steel shortage by Congressional investigations or by socializing the industry. The only permanent way to cure it is by industry expansion, which steel companies are doing to the limit of financial strength although it is eroded by government tax and renegotiation policies.

Red Market—Steel producers, says Mr. Batcheller, are taking what steps they legally can to relieve some distribution problems. They are trying

to ferret out the red marketeers. "Anyone in the steel-consuming industry taking advantage of his purchasing power to procure more steel than he needs like a housewife may hoard soap is a red marketeer and might as well ship it to Stalin himself." The total tonnage is small, he adds, but the damage to the steel industry and to free enterprise is immeasurable.

"The customer on our books," he warns, "who deliberately transfers a ton of our steel into the red market had better look for a new supplier the moment we find him out." To smash the red market, says Mr. Batcheller, requires not only the producers' efforts but also co-operation from users.

Kaiser Steel Profits Rise

Kaiser Steel Corp.'s registration statement, filed with the SEC to cover its forthcoming offering of common and preferred stock, shows the company in the 12 months ended last June 30 had net profits of $11,940,593, after payment of interest on its RFC loan and after federal taxes. This is about 21 per cent higher than net earnings of $9,850,753 in the previous 12 months.

Kaiser Steel's net sales for the year ended with last June increased to $84,480,816 from $74,339,995 in the preceding 12-month period.

About half of Kaiser's Fontana mill output during the last year has been channeled into pipe fabrication for several large pipeline contracts. One of the largest of these projects will be completed next month, that of Transcontinental Gas Pipe Line Co. Another large order from Trunkline Gas Co. will be completed June of next year.

Negotiations are reportedly underway for other pipeline projects which may continue to take a large portion of Kaiser's production. One order from Sinclair Refining Co. calls for delivery of 39,000 tons of plates for pipe during the February-June period of next year.

For the long-range future, Kaiser's recently-announced plans to build a 200,000-ton sheet and tin plate mill indicate the West Coast can look forward to becoming more self-sufficient in flat-rolled products some 18 to 20 months hence. In addition to the Kaiser plans, Columbia Steel Co. has started work on a mill to raise sheet and tin plate capacity by 215,000 tons —to around 540,000 tons annually— and Geneva Steel Co. is putting in a 100,000 ton sheet mill. It also is probable that Columbia will expand production at its southern California plant.

Locomotive Business Sold

H. K. Porter Co. sells patterns, drawings, spare parts to Davenport-Besler

H. K. Porter Co. Inc. announced the sale of its locomotive business—patterns, drawings, and spare parts business—to Davenport-Besler Corp. (Davenport Locomotive Works), Davenport, Iowa. T. M. Evans says the sale included an agreement that Davenport-Besler would service all Porter locomotives now in use. George Besler, chairman of D-B, explains his company will not only service all Porter locomotives being used but will build duplicate Porter locomotives, including Porter fireless locomotives. The arrangement was possible by including all drawings in the purchase.

Porter has been reducing its operations in the locomotive field in recent years in favor of a diversification of products.

Wayne Pump Buys Phillips

Purchase of Phillips Pump & Tank Co., Cincinnati, is announced by Wayne Pump Co., Ft. Wayne, Ind. Phillips manufactures lubricating oil dispensers, gasoline and kerosene units, grease dispensing equipment and rotary pumps.

Sterling Buys Van Wert Land

Carl E. Johnson, board chairman of Sterling Electric Motors Inc., says his company acquired an 11-acre tract at Van Wert, O., for the construction of a branch plant to serve the firm's midwestern and eastern business. Plans and specifications for the new plant building and equipment are being prepared. It is estimated that the Van Wert site will represent a $500,000 investment.

Sterling Electric motors and electric power drives are also manufactured in Hamilton, Ont., and in Santiago, Chile. Says Mr. Johnson: "It will take the full facilities of Sterling's Los Angeles plant to serve the demands for Sterling electric power drives in the West and for export."

'Safe' Ride

A SMOOTH BUT SECURE elevator ride will be assured prisoners in the new Richland parish courthouse and jail under construction at Rayville, La. Westinghouse Electric Corp., which was awarded a $24,800 contract for elevators in the five-story structure, will equip the cars with a special lock-up compartment for prisoners.

The automatic elevator will have a capacity of 2000 pounds—enough for ten large-size prisoners. It will be able to zip them up to any floor at a 100-feet-per-minute clip.

A similar car—without the special compartment — will provide additional facilities for law-abiding passengers.

Precision Addition Almost Done

Precision Steel Warehouse Inc., Chicago, expects to have an addition to its warehouse completed in December. The building will be of brick and glass block construction. Fifty tons of structural steel will have been used. Floor space of 7500 square feet will be provided for such products as annealed spring steel strip and sheets, brass strip, cold-rolled strip steel, flat wire, stainless steel strip, etc.

The company was organized in 1940. Besides the Chicago plant and main office the company owns a plant at Downers Grove, Ill. It houses the manufacturing division which manufactures packaged shim stock, feeler gages, music wire, drill rods and ground flat stock.

Du Pont To Build Chemical Plant

E. I. du Pont de Nemours & Co., Wilmington, Del., is planning construction of a new chemical plant at Memphis, Tenn. Estimated cost is $7.5 million. The plant will be built about 10 miles north of the business district on a 225-acre site bought last May and will be operated by the firm's electrochemical department.

The plant will make sodium cyanide, a basic chemical. Employment will be about 180 when operations begin. Construction is expected to start this winter. Completion is expected in about a year. Du Pont is thinking about building other units at the same site for the manufacture of related chemical products.

Diamond Buys Chromic Acid

Diamond Alkali Co. bought the chromic acid business of E. I. du Pont de Nemours & Co. Du Pont is one of the three chromic acid producers in the U. S. The product will be manufactured by Du Pont at its Philadelphia plant, and, under the terms of the sale, Diamond will take over distribution of the product the first of next year. Du Pont has been in the chromic acid business 15 years and holds a large share of the national market for the product, esti-

mated at 20 million pounds annually. The chrome-plating field—through the demand from the automotive and appliance industries—is the chief customer for chromic acid, although applications of the chemical are broadening.

Entering into the chromic acid business is a logical diversification in Diamond's line of chromium chemicals. The firm is a major manufacturer of sodium bichromate, an essential raw material used in the manufacture of chromic acid. It has facilities at Kearney, N. J., and Painesville, O. Nearing completion at both places is a rehabilitation and expansion program costing over $5 million.

Product Steel Building

A new $500,000 warehouse and general office building to serve the Chicago area is being erected by Production Steel Co. of Illinois at Broadview, Ill. The company bought about 220,000 square feet of vacant industrial land for construction of the one-story project.

Site is serviced by a siding of the Indiana Harbor Belt Railroad. Dimensions of the warehouse are 160 x 300 ft with 80-foot clear bays.

K-F May Relight Utah Furnace

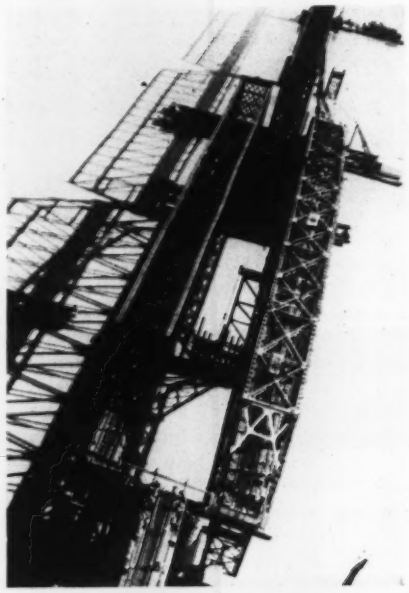
Kaiser-Frazer Corp. has completed a resurvey of its blast furnace facilities at Ironton, Utah, and is studying the possibility of reopening the plant, currently idle and on a standby basis.

Decision to relight the furnace probably will depend on military demand. If the facility resumes production for munitions purposes, some expansion may be undertaken.

Kano Erects Nashville Plant

Kano Laboratories erected an aluminum-covered plant at Nashville, Tenn., that is four times the size of its former quarters in Chicago. Kano is consolidating all operations in Nashville. The city was chosen because Kano thought Nashville would be within easy reach of most of the industrial areas of the country. The firm considers the climatic conditions there more favorable than in Chicago.

Kano makes Kano Kroil, "the oil that creeps," which is used for loosening frozen bearings, nuts and bolts, for testing leaks in welded tanks and for softening and controlling rust. Kano's other products are a clear rustproofing for polished metal surfaces, a weatherproofing for machinery stored outdoors, an instrument oil known as Microil and a purge for gasoline motors known as Kano Kreen.



ROLL OUT THE OLD: Racing the clock to get traffic rolling again on the Illinois Central bridge over the Ohio river at Cairo, Ill., workmen for the American Bridge Co. start rolling in a new 518-foot span, first of nine to be erected. The old span (left) was rolled over to rest on temporary falsework. Later it will be launched into the river to be cut into scrap

Steinle Machines Get Outlet

Pratt & Whitney Division of Niles-Bement-Pond Co., West Hartford, Conn., will handle sale of Steinle centerless thread-rolling machines through its national selling organization. Steinle machines are being used to produce American National Form, A.N.P.T., Acme, Whitworth and metric threads on a variety of hollow, solid and irregularly shaped work including studs, bolts, precision screws, spark plug shells, aircraft fittings and valve stems. Steinle machines are also used for the precision rolling of worm threads of the type used in calculating machines, oscillating fans, food mixers, etc. Pratt & Whitney's sales organization will give national coverage on all precision thread rolling problems with the Steinle Machine Co., New Britain, Conn., providing necessary technical assistance, demonstrations, test runs, production estimates and service.

Southern States Building More

A $275,000 expansion program for its Birmingham plant was announced by Southern States Iron Roofing Co. It will construct a new office and warehouse building adjoining its present plant and will add several other items to its line. Employment will be increased to about 300.

Laundry Machinery Adds Space

Ground was broken for a new building containing 73,000 square feet, for manufacturing operations of American Laundry Machinery Co. The site is near other company shops in Norwood, adjoining Cincinnati.

The expansion is based on market demands, J. M. Garvey, company president, said. Other manufacturing units are located in Rochester, N. Y., Kenilworth, N. J., and Toronto, Canada.

Buick To Get V-8 Engine Plant

General Motors' Buick Motor Division will construct a new engine plant that is expected to cost about $75 million at Flint, Mich.

The new unit will have 660,000 square feet of floor space and covers 16 acres. It will be adjacent to Buick's present plant and is described as the largest to be built in Flint since the war.

Trade sources (STEEL, Aug. 21, p.74) have indicated that the structure, equipment for which is now being figured by machine builders, will be used for production of a high-compression V-8 engine that is slated to be introduced about a year from now in 1952 models. The plant will be ready inside of a year. Albert Kahn Associates, Detroit, is architect; J. A. Utley, general contractor.

Snubbers by Burgess Manning

When natural gas from the Southwest starts flowing into the New York metropolitan area through the 1832-mile transcontinental pipe line, exhaust snubbers that were designed to reduce noise, improve exhaust scavenging and reduce spark danger will play a role in the operation. Burgess Manning, manufacturer of the snubbers, reveals that two types of snubbers were installed on engines in 14 of the pipeline's 20 compressor stations that will force the gas through the $200 million pipeline.

Compressors are about 80 miles apart along the line, and one type—SDL series Side Inlet Spark Extinguisher—is installed in the Cooper Bessemer GMW-10, 2400-horsepower units and the Clark Brothers BA-8, 1600-horsepower engines. The 30-inch line, ultimately carrying 505 million cubic feet of gas to the Atlantic Seaboard daily, is expected to make first deliveries by Dec. 1.

Faster Depreciation

NSRB Chairman Symington has the power to say what's eligible for five-year amortization

W. STUART SYMINGTON, chairman of the National Security Resources Board, has been granted the power to say what facilities are eligible for accelerated depreciation under the new tax law.

The revenue measure signed Sept. 23 by President Truman provides for five-year amortization of facilities certified by the government as "essential" to the rearmament program. The law left to the President the discretion to designate the certifying agency.

Delegated — Mr. Truman directed Mr. Symington to call upon other federal departments and agencies for their recommendations on applications for the accelerated depreciation privilege. That means, says an NSRB spokesman, that any businessman who wants to take advantage of the speed-up should apply to the agency which has jurisdiction over his particular industry. Don't apply to the NSRB, which will give the final review and decision after the agency concerned has studied the matter.

The Interior Department will have jurisdiction to recommend with respect to petroleum, gas, solid fuels and electric power; the Agriculture Department with respect to food, farm equipment and the like; the ICC with domestic transportation facilities; the Commerce Department with all other materials and facilities. The Defense Department would have power to make recommendations on plants that would turn out such end products as tanks and planes. The ICC has been eager to permit railroads to speed up their freight car orders through the tax depreciation provisions.

Speed-Up—The new tax law provides a special five-year plan for amortizing defense plants and facilities. The feature could apply to any facility completed after Dec. 31, 1949, provided Mr. Symington approves. The new provision will permit certified facilities to be depreciated at the rate of 20 per cent a year for a five-year period. After that it would be completely written off with no more tax deduction available from depreciation.

If the special amortization privilege is used and the taxpayer should then sell his plant, he would pay ordinary income tax, rather than the lower capital gains rate—on that part of his profit which represented the amount by which the accelerated amortization exceeded the normal depreciation. On the rest of his profit he would pay at the capital gains rates.

Foundry Backlogs Climb

Backlogs of jobbing gray iron foundries average two months or more. This was indicated in discussion at the 22nd annual meeting of the Gray Iron Founders' Society in Cincinnati. Compared with a year ago, when activity was near the 1949 bottom, the upturn in castings output, number of employees and working hours has been sharp.

Col. Earl D. Payne, industrial liaison officer, Munitions Board, told the convention that preparation of an industrial mobilization program for the gray iron foundry industry will start soon. Preparations will include a resume of the industry's casting potential and materials and manpower requirements.

Oliver Smalley, president of Meehanite Metals Corp., New Rochelle, N. Y., received the society's gold medal award. He was cited for pioneering work as first technical director of the group. Arthur W. Palm, Link-Belt Co., Philadelphia, got first prize in the society's redesign competion, the first award in a contest to determine the most significant examples of redesigning components for production as a casting in place of some other form of fabrication.

New president of the society is E. L. Roth, Motor Castings Co., Milwaukee, who succeeds H. P. Good, Textile Machine Works, Reading, Pa. Other officers elected are: Vice president, R. G. Schaefer, Schaefer-Goodnow Foundries Inc., Pittsburgh; secretary, J. S. Parrish Jr., Richmond Foundry & Mfg. Co., Richmond, Va.; treasurer, H. J. Trenkamp, Ohio Foundry Co., Cleveland.

New directors are: W. O. Larson, W. O. Larson Foundry Co., Grafton, O.; George Gilson, J. E. Gilson Co., Port Washington, Wis.; George Mellow, Liberty Foundry Co., St. Louis.

E. L. ROTH
President, Gray Iron Founders

Navy Orders from Canadian Firm

An order for three-inch, 50-caliber, rapid-fire antiaircraft naval guns valued at about $10 million has been placed by the U.S. Navy with Sorel Industry Ltd., Sorel, Quebec, Canada. The gun is designed for use on large combat ships.

The order, placed through the Canadian Commercial Corp., carries out the policy of reciprocal procurement of military equipment adopted by the governments of the U.S. and Canada. Under this agreement, specialized industrial capacity will be utilized to meet the military requirements of both countries.

Armco Drainage To Expand

S. R. Ives, president of Armco Drainage & Metal Products Inc., a subsidiary of Armco Steel Corp., announced a $150,000 expansion program for the new Armco manufacturing plant at Washington Court House, O. Expansion calls for two bays totaling 24,000 square feet of floor space to the existing building. New facilities will be used principally for manufacture of certain types of steel buildings

Rosie the Riverter Returns

"Rosie the Riveter" has returned to the swing shift.

Rapidly expanding San Diego, Calif., aircraft plants have started hiring women for production work, as they did in World War II.

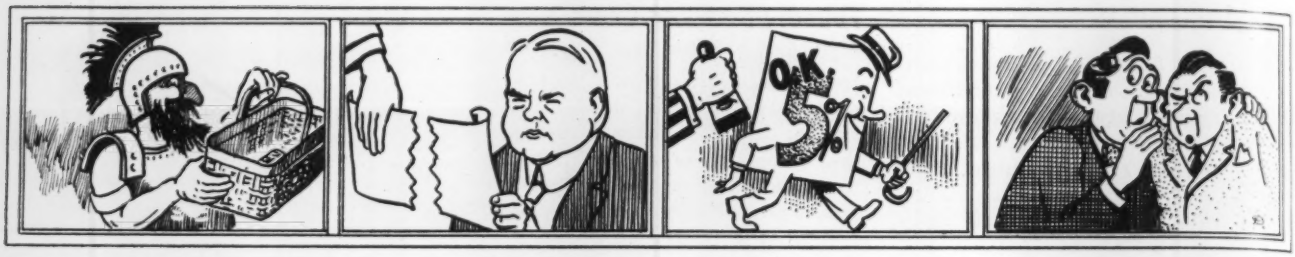
With the available supply of manpower dwindling rapidly in the face of expanding defense needs, employment of women from among those who gained aircraft experience in the last war has been resumed at plants of Consolidated Vultee Aircraft Corp., Ryan Aeronautical Co. and Solar Aircraft Co.

Quaker Facilities Growing

Quaker Chemical Products Corp. is expanding its facilities at the Conshohocken, Pa., plant. Contracts have been let and orders placed for installation of new boilers and a boiler house that will give almost three times the boiler capacity available now. Completion is expected before yearend on the boilerhouse.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor, STEEL*



War Shopping | Half of Hoover Plans | Stamp of Approval | Oral Communication

The government wants to know about your war-products potential. In a survey to be supervised by Commerce's Small Business Division it hopes to get more dope

WHAT PRODUCTS are you now making? What's your capacity? What raw materials do you need? What—so far as you know—can you produce for war?

Those questions are to be asked of all manufacturers in a government survey to be made soon. Its purpose is twofold: The government wants a complete inventory of capacity for prime contracting and subcontracting in case there's an allout war. And it needs information for shaping a wise policy on who should get what in the way of materials if a big war comes.

What Makes Sammy Run?—The survey is to be conducted by state and local agencies under supervision of Commerce Department's Small Business Division. Small Business hopes to make recommendations to the National Production Authority on allocations, conservation and end-use limitation orders calculated to keep the economy going in war.

When it comes to contracting and subcontracting on war needs, the information will be used at state and local levels, something like this: Say a manufacturer at Utica, N. Y., receives a big prime contract. He would go to a central office (it might be Albany, N. Y.) for information about potential subcontractors in a radius of about 100 miles of his plant. A prime contractor in Akron might go to an office in Columbus, etc.

The survey will not embrace the 35,000 manufacturing plants now registered with the Defense Department as actual or potential prime contractors. Six thousand already have phantom contracts for production that is to start on receipt of telegrams on M-Day. The other 29,000 are being surveyed for possible phantom orders.

Character & Capacity—Commerce Department spokesmen tell STEEL that the coming survey will avoid the mistakes that vitiated the value of a similar survey by the Smaller War Plants Corp. (SWPC) in World War II. That survey was a continuous one, the theory being that by keeping track of plant improvements SWPC could tell at a glance, or several glances, just what facilities were installed at each plant, to what tolerances the plant worked, etc. But the job was much too cumbersome. It was always behind the time and served no practical purpose in speeding up war-utilization of industry.

The new survey will indicate merely the character and capacity of each plant and give just enough information to a prime contractor to help him determine what plants to consider for subcontracting.

The Other Half Next Year?

About 50 per cent of the government-reform measures advocated by the Hoover Commission on Reorganization of the Executive Branch of the Government were adopted and now are incorporated in the functioning of government agencies, according to an analysis by Rep. Clarence J. Brown (Rep., O.). Those interested will find Mr. Brown's report in the Congressional Record of Sept. 14, starting on Page A6856 of the Appendix. Now the Chamber of Commerce of the United States is launching a drive to get the next Congress to adopt the remaining Hoover commission recommendations.

Five Per Centers OK'd . . .

Washington middlemen who were sharply criticized as "five per centers" during a 1949 Senate investigation are recognized, in an income-tax opinion of the United States Tax Court, as performing functions for which compensation should be paid. The case involved payment by the Aetna-Standard Engineering Co., Youngstown, O., of $59,496 to Milburn & Brady Inc., Washington, for assistance in getting World War II contracts to build gun carriages for the Army. The sum paid was held to be "reasonable compensation for services performed" by the agents during a period of 17 months.

Don't Write It, Say It . . .

Some Washington trade association executives have stopped sending "confidential" news letters to their members. They're dangerous, they say, because of the embarrassment sustained when such letters were aired in the lobby investigation early this year. Executives who have discontinued this practice now save their racy nuggets of information for oral presentation to their members. The trend is toward more frequent meetings—not only to hear these "inside" stories but to consider industry problems incidental to the rearmament program.

On Controlling Business . . .

The British government is calling in one of our government experts to advise it on problems incidental to control of business and industry in the United Kingdom. Federal Trade Commissioner Lowell Mason will give two lectures at the School of Economics & Political Science of the University of London in November. He will also talk on the subject of control of retail distribution before the British Board of Trade and on monopoly problems before the Monopolies & Restrictive Practices Commission. The latter is the British counterpart of our Federal Trade Commission.

Europe Raises Its Foreign Trade Sights

Nations concentrate on more intra-European trade, more dealings with Latin America and more dollar business. Europe's exports 20 per cent above 1938 level

EUROPE is cruising its economic recovery vehicle—foreign trade—at higher speeds.

Its total export volume is averaging 20 per cent above prewar levels. The improvement has boosted hard currency reserves by more than $1 billion. In shifting to a new cruising speed, West European nations are still tinkering with the engine to get even better performance. They're concentrating on more intra-European trade, more dealings with Latin America and more dollar business.

Laggard—Although total exports are up 20 per cent, intra-European trade is only 15 per cent ahead of the 1938 level. High tariff walls and red tape stifle further increases. Following the example of the successful customs union of Belgium, Luxemburg and the Netherlands, other countries are considering tariff reductions. France and Italy are negotiating for a union that would completely abolish tariffs for six years following the date of ratification. Negotiations are proceeding slowly, as they also are with the Schuman plan for an industry pool to remove customs barriers.

The second area for trade improvement is with Latin America. In terms of 1948 prices, the total turnover of goods (imports and exports) between Europe and Latin America has dropped sharply since 1928. The turnover totaled about $6 billion in 1928, $4.5 billion in 1938, $3.5 billion in 1948 and $3 billion in 1949.

Picking Up—In the first half of this year, the trend was reversed for the first time in 22 years. The 1950 turnover is expected to exceed $3 billion. The United Nations is starting a study to find the reason for the 22-year trend. The study will seek to promote joint efforts to increase the exchange of goods, to solve finance and payments problems and to promote exchange of information.

The Latin American market is understandably juicy. In Venezuela, for example, per capita real income has risen 66 per cent in 13 years. Venezuelan foreign trade in 1949 represented 80 per cent of its national income. Its imports last year were worth $100.8 million.

U.K. Leads in Dollar Market

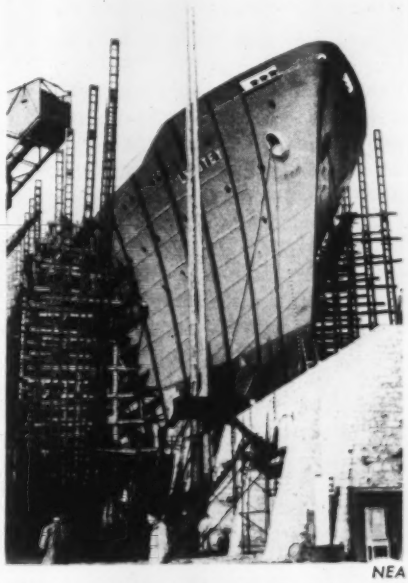
In the third area for trade improvement—with the dollar markets—Britain is doing the best of any European nation. U. K. sales to the U. S. and Canada averaged $43 million a month in the first quarter of 1950, $49 million in the second quarter and have been exceeding $60 million a month.

The $60 million average surpasses the $50 million average for the fourth quarter of 1948, the previous postwar high, even though the 1948 figure is computed at the old rate of $4.03 to the pound.

British dollar trade is usually predominantly with Canada, but since the Korean war started its U. S. business has exceeded that from Canada. In July, $32 million was with the U. S. and $29 million with Canada. In the first 1950 quarter, average was $29 million with the Dominion and $20 million with Uncle Sam.

Helping to get the added dollar business with the U. S. are British subsidiaries and affiliates of American companies. Honeywell-Brown Ltd., a subsidiary of Minneapolis-Honeywell Regulator Co. has been selling its British-made products to the parent firm. Honeywell-Brown started a plant in Scotland in December, 1948. One of the subsidiary's first products was a steel case of complex design and requiring 51 tools. Honeywell-Brown eventually found it could deliver in Philadelphia a case of equal quality and at a competitive price to that produced in America. The British firm plans to increase sales of those cases to the parent.

British steel production in September was at the annual rate of 18,999,680 net tons, the best rate ever achieved for a September. Total steel output in the first nine months of 1950 amounted to 13,571,000 tons, 594,000 tons more than for the same period last year which was the previous record.



NEA

PRE-INDUCTION CHECKUP: The new French liner, Mahechal Lyautey, got some finishing touches in the La Seyne dockyards in France before its launching last week. The 9300-ton luxury vessel will see service in the Mediterranean between Casablanca, Morocco, and Marseille, France

Aussies Get Trade Booster

A trade booster for Australia is a $100 million loan from the International Bank for Reconstruction & Development. The loan will be used for capital goods and equipment needed for developmental projects, both private and governmental, in the next two years.

The money will be used for irrigation construction projects, hydroelectric plants, and railroad expansion projects. The government plans to boost production of copper, lead, zinc and steel by buying more American equipment.

Less lead, zinc and silver and more tin and copper were produced in Australia last year than in 1948. In 1949, 213,491 tons of lead were produced compared with 216,955 tons the year before. Last year 181,998 tons of zinc were produced compared with 190,469 tons in 1948. The output of 9,849,213 ounces of silver in 1949 was 200,000 ounces lower than in 1948. Copper production was about 1,000 tons higher, at 13,462 tons in 1949, than the year before, but it was still only about half the record 1944 output. Tin production totaled 1973 tons in 1949, compared with 1874 tons in 1948.

Australia may eventually become an important aluminum producer. A project at Bell Bay in Tasmania is now under construction which in another two and a half years will be producing aluminum at the rate of 13,000 tons a year.

Korea Mineral Resources Rich

Although Korea covers an area only a little larger than the state of Utah, it is rich in mineral deposits, says American Iron & Steel Institute which bases its findings upon a study of Bureau of Mines figures.

In 1948, Korean mines shipped nearly 3.6 million pounds of tungsten

ore to the U.S. and were America's second largest source of imports. In that year, South Korea was the world's second largest producer of graphite. Fluorspar and molybdenum mines south of the 38th parallel showed production gains during 1949.

In 1944 Korea was the world's second largest producer of tungsten ores, ranking only after the U.S. In that year South Korea alone was the sixth largest world source of molybdenum. Korea also ranked eleventh of the 37 manganese producing nations and fifth as a fluorspar producer. Korea has iron, cobalt, copper, nickel, magnesite, lead, vanadium and zinc. Good coking coal is lacking.

McKee Gets Brazilian Contract

Arthur G. McKee & Co. has landed a $45 million contract from Companhia Siderurgia Nacional of Brazil covering engineering, material procurement and construction services for a steel plant expansion program.

Under previous contracts, the company built the integrated iron and steel plant at Volta Redonda for Siderugia Nacional. The new work will include coke ovens, another blast furnace, two open hearths and expansion of rolling mill facilities.

It's Bike Transmissions Now

Turn-about is fair play. Foreign companies have been adapting American products to their uses for years; now New Departure Division of General Motors Corp. is putting out for American consumption its refinement and version of a device that heretofore has been produced in volume only by foreign manufacturers.

It's Triplspeed, a multispeed transmission, coaster and brake for bicycles. The device combines: A low gear with a 25 per cent reduction for hill climbing, for riding against a strong wind, for riding on bad roads and for fast getaways; a second gear for all normal riding or for slight upgrades; a high gear with a 33 per cent overdrive for level stretches or slight downgrades and for riding with the wind behind you; regular bicycle braking; and regular free-wheeling. The unit can be installed in the hub of a New Departure coaster brake.

Americans Go Long Way for Cars

That the American will go a long way to get a car is demonstrated again. To satisfy demand for automobiles, the Hambro Trading Co. of the United States placed a $4 million order with Nuffields of London for 3800 Morris, Riley and MG cars.

Venzuelan Ore Soon

Developing the project is a matter of a lot of mud, a lot of money and a lot of work

U. S. STEEL Corp. is about ready to proceed with development of iron ore deposits in Venezuela, and Bethlehem Steel Co. will begin volume ore shipments from the country soon.

Venezuela Up-to-Date, a publication of the Venezuelan embassy in Washington, says the government of the South American nation is studying U. S. Steel Corp.'s plan to move the iron ore out of the mines by seagoing ships of up to 40,000 tons.

A Lot of Mud—That will mean dredging the Orinoco river over a considerable distance, but will cost much less than the alternative plan to build a 275-mile railroad from the mines to the Caribbean shore, estimated to cost more than $113 million and necessitating a four-mile bridge and viaduct over the Orinoco.

The river flows into the Atlantic through numerous channels called *canos,* some of them miles apart from each other. The channel to be dredged is the Macareo, the shortest and straightest. Dredging operations will extend from the mouth of the Caroni river, near the city of San Felix, to the Paria Gulf, south of the British island of Trinidad. Dredging can be completed more quickly than building a railroad. Work will start by the end of 1950 and continue about four years. The laying of railroad tracks would take about five or six years.

A Lot of Money—Orinoco Mining Co., the U. S. Steel subsidiary which has the Venezuelan concession to exploit the Cerro Bolivar ore range, will spend $120 million in various essential projects, including its share in the cost of dredging the river, construction of a 94-mile railroad from the mine site south of the Orinoco to San Felix, port improvements, workers' houses and administration buildings.

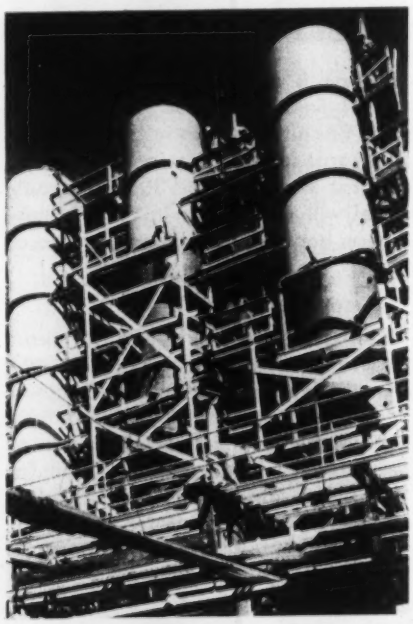
When the river has been dredged to 26 or 28 feet deep, the Cerro Bolivar ore will be loaded in ore-carrying boats for direct shipment to the U. S. Shipments will be at the rate of 10 million tons a year.

A Lot of Work—Bethlehem Steel Co.'s subsidiary, Iron Mines Co. of Venezuela, has concessions in Palua and El Pao in the same general area as Cerro Bolivar, but nearer the Orinoco. A railroad has already been built from the El Pao mines to the port of Palua, where unloading and loading facilities have been installed. From there, the ore will be carried on barges through the Manamo channel to Puerto de Hierro across the Paria Gulf where it will be transshipped to ocean-going vessels.

Because the company doesn't have to worry about river depth by using barges, it has gone ahead with mining operations and will start volume shipments soon.

A Lot of Ore—The ore deposits in the general area in which U. S. Steel and Bethlehem have concessions are far more extensive than first anticipated, according to experts of the Central University of Caracas. A commission reports the Cerro Bolivar deposits alone contain 300 million tons of iron. The ore is 60 per cent pure iron.

The newly discovered deposits in San Isidro, also south of the Orinoco, may contain 600 million tons of iron, the ore having a 75 per cent iron content. Those deposits have been declared reserve zones by the government. A survey is also being conducted to find the extent of manganese deposits found around the same location.



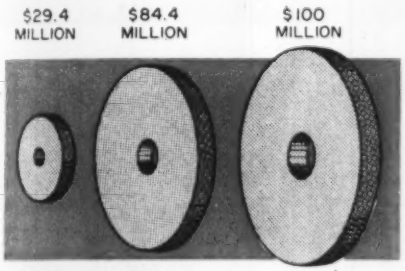
E-X-P-A-N-S-I-O-N: Work of reactivation and modernization starts on the first of the nation's standby GR-S synthetic rubber plants ordered back into production under the government's expanded program. The plant is being reactivated by the Naugatchuck Chemical Division of United States Rubber Co. for the Office of Rubber Reserve. It started production ten days ago, 20 days ahead of schedule. When operating at peak capacity it will add over 72,000 long tons annually to the nation's rubber supply. The workmen are checking huge stripping columns where synthetic rubber latex is purified. Plant is at Port Neches, Tex.

Grinding Smoother

The grinding and cutting industry will have done three times better this year than in 1939

THE ABRASIVE grinding and cutting wheel industry sees smooth sailing to a $100 million production year in 1950. That's more than three and a third times the 1939 volume (see the chart), and grinding wheel prices have risen an average of only 24 per cent since then.

Government orders thus far have had little effect on the high sales volume, but the indirect effect of the



* Estimated

Korean war is large. The strong, direct impact of government ordering will come in the first quarter of 1951, predicts Sterling Grinding Wheel Division of Cleveland Quarries Co.

A Big Chunk—Some 32 companies will produce 99 per cent of the $100 million volume this year. Another 20 firms or so, which account for the remaining 1 per cent, make special grinding and cutting wheel products. The largest producers are Norton Co. and Carborundum Co.

Major users of the industry's products are automobile, foundry and steel companies. Heavy automotive use partly accounts for the fact that more than 50 per cent of the grinding wheel industry's output is consumed in the Midwest. Some of the increased demand for grinding wheels arises from greater production of stainless and tool steels. Another application for grinding wheels that's of mounting importance is in the finishing of magnetic steels for television sets and door-closing devices on refrigerators. More new products and applications have been developed by the industry in the last five years than in the 30 preceding.

Art for Output's Sake — Chicago Wheel & Mfg. Co. and others in the industry say grinding wheel manufacture is an art. There are probably 6 million different combinations of specifications. The complexity in the industry has arisen partly because of competition within it and partly because of competition with other metal finishing techniques.

Grinding wheel manufacturers are just beginning to feel raw material shortages. Rubber is more difficult to obtain, as are the resins used by the industry for bonding agents. Export markets are fair to poor. The best potential market is in South America.

Seasonal Buying Is Poser

What does a company do to keep its place in line with suppliers when it operates on a seasonal basis and some months needs to buy very little?

Acton Mfg. Co. Inc., Arkansas City, Kans., maker of beverage bottle carriers and portable coolers, is trying to solve the problem with this letter: "It's our duty not to engage in any unnecessary stockpiling. When offered those materials of yours that we use, we would like to be in a position to accept any part, all or none and still not lose our place in line because of our requirements falling off during this time of the year. We still want all our future allotments based on your allocations, but will not order part or all of same unless needed. Then possibly, our not needing our full allocation of your materials at this time will assist you with some of your other customers. We want to co-operate with you in every respect and at the same time have your assurance that we shall be taken care of."

Metallurgy's Use of Stone Falls

About 14 per cent of the 222,408,140 tons and $289.7 million worth of crushed and broken stone produced in the U.S. last year went for metallurgical uses, says the Bureau of Mines. That was a decrease of 13 per cent quantity-wise and a decrease of 7 per cent in value compared with 1948.

Limestone for agricultural purposes increased 3 and 4 per cent respectively, in quantity and value over the previous year's figures. Some 10 per cent of the total tonnage produced went for those purposes. Concrete aggregates and railroad ballast took 63 per cent of total output in 1949.

Steep Rock Ore Shipments Up

Iron ore shipments from Steep Rock Iron Mines in Ontario, Canada, passed the million-ton mark on Oct. 13 for the 1950 season, as compared to 970,000 tons on the same date a year ago.

Total shipments for the full 1949 season were 1,134,261 tons. The company has good prospects of surpassing its alltime record of 1,206,000 tons set in 1947. Steep Rock was deprived of almost two weeks' shipments by the Canadian rail strike in August, but since has more than regained the lost ground.

Materials Handlers To Meet

A materials handling conference will discuss special problems in more than 50 industries. Materials handling is a phase of industry that now involves 25 per cent of production payrolls. The conference will be held during three of the five days of the fourth Materials Handling Exposition at Chicago's International Amphitheatre, Apr. 30-May 4.

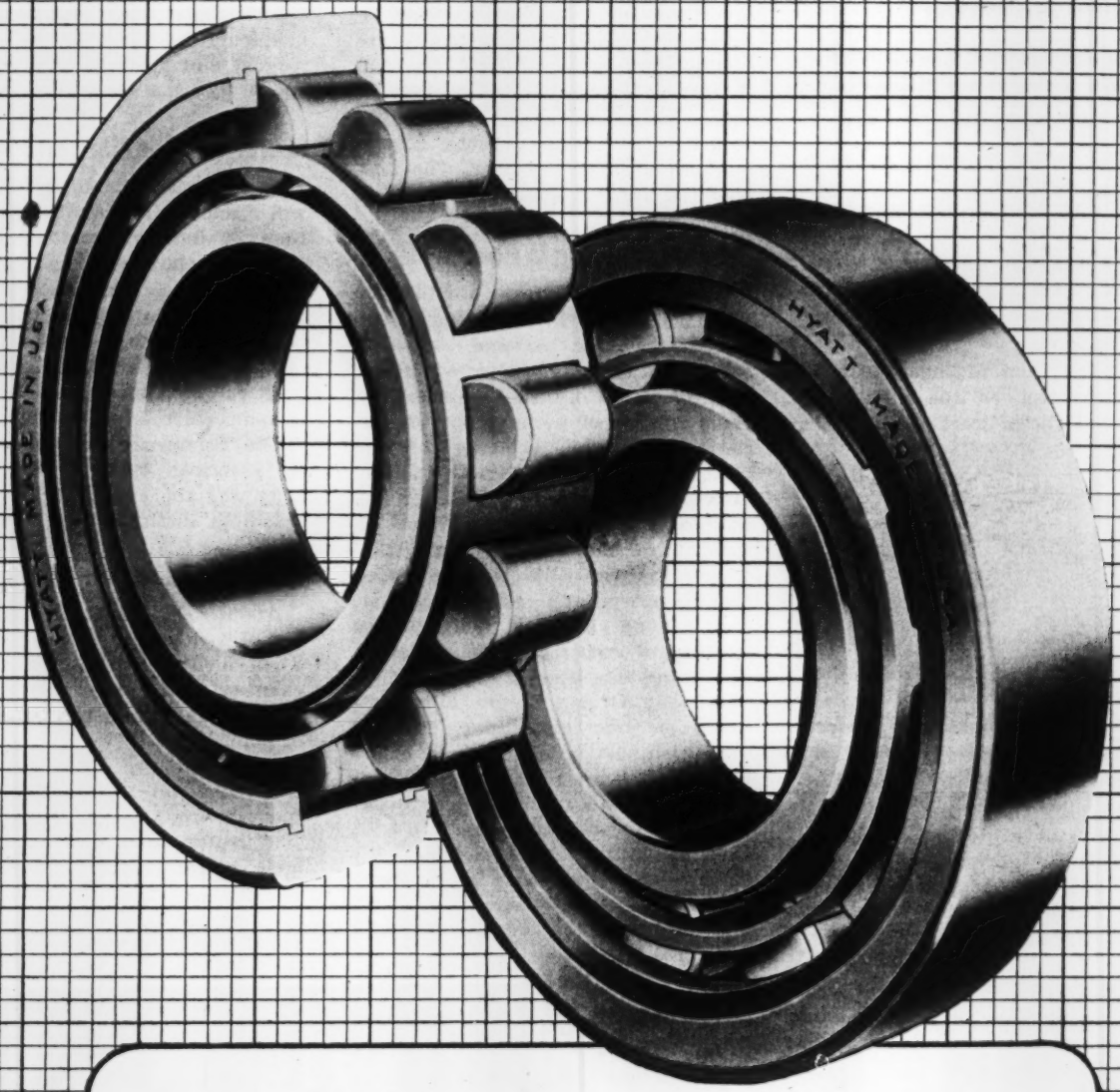
The conference will be sponsored by American Material Handling Society and the exposition by Material Handling Institute.

Teachers Learn About Industry

About 500 teachers in 38 public school systems in eastern Ohio and western Pennsylvania are getting chances to see the workings of 34 different industrial plants in a series of plant tours.

The tours are being arranged by the Industrial Information Institute Inc., an organization formed by over 100 industries in the area to build up a better public understanding of industry.

A BELT OUT OF THIS: The largest conveyor belt ever built and shipped in a single roll is this 48-inch-wide, 45,000-pound roll completed in the new $5-million belt plant of B. F. Goodrich Co., Akron, O. Designed by Goodrich engineers for the Baltimore & Ohio Railroad, the belt will bring ore from ship to shore at the railroad's new dock in Baltimore. E. R. Traxler, chief engineer on flat belting, puts the rule to the giant belt



HYATTS...to your advantage

In steel rolling mill tables, cranes, cars, motors and auxiliary equipment everywhere, Hyatt Roller Bearings are serving and saving.

The straight cylindrical construction of Hyatt Roller Bearings allows for journal expansion—they take the heavy impacts and excessive loads—their maintenance is easy and they require but infrequent lubrication.

Just a few of the reasons why Hyatts are used so extensively for steel mill applications and why it's to your advantage to specify them for all new equipment and use them for changeovers. Hyatt Bearings Division, General Motors Corporation, Harrison, N. J.

HYATT ROLLER BEARINGS

By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

How much "austerity" will be noticeable in 1951 models won't be determined until after the first of the year. Critical items seem assured until Dec. 31. After that all is murky

DETROIT

NEW Cadillac, Olds, Buick, Pontiac and Chevrolet models will be coming through on schedule. Starting dates will be staggered over the last two months of the year, so any sharp drop in overall General Motors passenger car output may be avoided. At one time it appeared Pontiac was going through with some major changes, including longer wheelbase and a shift to the "B" series of Fisher bodies instead of the present "A" types. Now the word is that this program has been deferred until the 1952 models. The meaning: Pontiac six and eight will continue pretty much as they have been since 1949.

Watch for Austerity — Just how much "austerity" will be noticeable in 1951 models won't be determined until after the first of the year. At the moment, adequate steel supplies, decorative trim and other critical items seem assured through Dec. 31. Beyond that date all is murky. The matter of chromium plating alone is perplexing, since on the basis of present allocations of essential nickel it will not be possible to sustain present automotive volume with the amount of plating required. Some platers think they can get by the first quarter of 1950; others are less sanguine.

Who Knows?—Hopes for a clearer picture of the materials outlook as it may be affected by defense requirements melted away after a meeting last week between representatives of all passenger car manufacturers and William H. Harrison, chairman of the National Production Authority, in Washington. Mr. Harrison explained the meeting was mainly in the nature of a get-acquainted session, since he had no blueprint of what the Defense Department intends to spend its billions for, or of what they would mean in terms of materials. He pointed out that while current defense expenditures were relatively small, the armed forces are now preparing appropriation requests for the next session of Congress that look like they might cut into civilian production appreciably. Right now, nobody knows how much, or when, or where or precisely why.

Bite of the Pie—The motor executives came away frankly disappointed over the lack of any specific details and suggested maybe it would be a better idea to step up steel production still further to meet the added defense load, rather than to bite into their pie. At the same time the manufacturers were quoted by Mr. Harrison as being "willing to absorb any necessary impact on production that military needs might require."

Wails & Rumors — Meanwhile anguished wails have arisen from the nation's new and used car dealers over the sudden clamping of new and rigid controls on credit by the Federal Reserve Board. On Oct. 4 the National Automobile Dealers Association, after hearing rumors of impending new controls, requested an opportunity be given the dealers to discuss the matter with the board. But with no warning the new restrictions, limiting time payments to 15 months, were clamped in place. The NADA protested . . .

"We're astounded at arbitrary and drastic action taken without giving the industry affected the opportunity to present facts indicating the alarming slow-up in new and used automobile sales." In some areas of the country, the NADA says car sales have declined 50 per cent or more since the imposition of the first tighter credit controls on Sept. 18.

In Reserve—The trouble with advance announcement of credit controls is that it serves only to drive up sales artificially for a short time, creating the reverse condition of what the controls are seeking to effect. At the same time, it is well to discount dealers' howls for a while until the situation can be appraised more accurately. They have always been prone to scream before they are hurt. Representatives of manufacturers have not yet become alarmed, feeling the immediate need will be for more intensive sales efforts and then, if credit controls do prove to be throttling sales to the point where production must be cut back, a relaxation of the regulation can be accomplished quickly.

Breakdown of 1950 Auto

These materials are used in a 1950 four-door sedan. Figures are in pounds net. Car weight is 3824 pounds

Steel	2556.29
Gray iron	521.15
Malleable iron	99.60
Aluminum and alloys	11.39
Copper	25.99
Copper alloys	15.61
Lead and alloys	30.39
Zinc and alloys	66.06
Antimony	1.12
Chromium	6.06
Manganese	18.82
Molybdenum	0.08
Nickel	1.06
Silicon	17.35
Tin	1.37
Fabric	92.26
Glass	76.28
Lubricants	15.16
Paper	55.05
Rubber compound	205.63
Sound deadener	10.83
Plastic—thermosetting	2.38
Plastic—thermoplastic	2.87
Asbestos	2.60
Cork	0.626
Mica	0.102

This is an accurate engineering breakdown of a specific 1950 model and is not all-inclusive. Thus, small traces of elements like vanadium and tungsten are not listed, nor are more important weights of materials such as paint and wood. The total of the listings will not equal the car weight, since some elements are figured separately where they may be included as alloys in iron and steel. But the relative position of those materials listed is typical. Source: C. L. McCuen, head of General Motors Research Laboratories

The 1951 Models Come Out

Studebaker, Mercury and Hudson now have their 1951 models on the market and dealers' stocks are being replenished quickly. Highlight of the new Studebaker is the initial appearance of a new V-8 overhead-valve engine in the Commander series, requiring an investment of $15 million in development and expansion of manufacturing facilities and placing the company on equal footing with others now producing new engines of this type suited to higher compression ratios and resultant economy.

The Weight Goes Down—The Studebaker V-8 has a rating of 120 hp

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at 4000 rpm and piston displacement of 232.6 cubic inches. Like the Olds and Cadillac power plants, it is of the oversquare type, bore being 3⅜ inches against stroke of 4¼ inches. Compression ratio at present is 7:1. As fuels of higher octane ratings become available this can be raised progressively without seriously disturbing manufacturing processes. Compactness of the V-8 unit has permitted shortening overall length of Commander models to 197½ inches, which is partially reflected in a weight reduction of 205 pounds.

Exterior lines of Commander and Champion models continue the general styling introduced last year, with minor alterations around a new grille, "spinner" and bumper support splash shield which completely encloses the bumper support bars. One-piece windshields are standard throughout the line.

New Use for Plastics—Topping the list of chassis changes are new rear springs of the four-leaf type with the width increased to 2½ inches. Inserted between the leaves are polyethylene plastic liners, claimed to eliminate squeaks, seal out dirt and grit, in addition to maintaining alignment. The latter is possible because of the shape of the extruded plastic section, which carries a bead or flange along each side, extending about ⅛-inch above and below the flat portion of the liner, the latter being about 1/32-inch thick.

This marks the first appearance of such a liner, developed by engineers of the Spring Perch Co., Lackawanna, N. Y., one supplier of the springs. Polyethylene, possibly the hottest thing in the plastic field at the moment and going into everything from nursing bottles to cables, is a thermoplastic material furnished by both Bakelite and Dupont as a resin or molding material and costing 75-80 cents a pound. Originally a German development, it was discovered by the British during the war as the secret of the high perfection of German walkie-talkie equipment.

All Over the Map—Hundreds of commercial applications for polyethylene have resulted, particularly in the packaging, television and communications fields. New uses in military equipment are putting heavy pressure on suppliers of the material who have expanded facilities as much as four times in the past few years and are now doubling them again.

One difficulty now is that the military is grabbing up every pound it can lay its hands on with the result commercial users find it nearly impossible to buy. The plastic has a waxy feel, providing a self-lubricating surface in the spring installation, is unaffected by extremes of heat and cold and has exceptional toughness to resist interleaf friction. It is impervious to water, salt and other road chemicals.

Shiftless Mercury — Mercury for 1951 will be giving a big play to a new automatic transmission, called the Merc-O-Matic, and manufactured by both Ford and Borg-Warner. Combination of a hydraulic torque converter and three-speed planetary gearing, plus two clutches and two bands hydraulically operated to control the ratio changes, the transmission uses a total of 24 aluminum die castings, three of which are major parts weighing approximately 15 pounds. Novel feature is the torque converter which utilizes a die-cast impeller cover into which are recessed stamped steel blades. The stator is of die-cast construction while the third element, the turbine, is of full sheet steel construction. No welding or copper brazing is used to to secure blades to the main shell stampings or casting. Instead, they are held in place by tabs which are rolled down in assembly. Cooling is entirely by circulation of air through the housing enclosing the converter, with fins on the outer surface for heat transfer.

Hudson Takes a Flier—Hudson will be tooting the horn for its Hornet model, an entirely new line, featuring 6-cylinder engine with exceptional power. Other Hudson 1951 models include the Commodore 8, a Super 6 and a Pacemaker 6. Optional equipment on the Hornet and Commodore includes Hydra-Matic transmission, adding another to General Motors' list of customers for this device.

Auto, Truck Output

U. S. and Canada

	1950	1949
January	$ 609,882	445,092
February	505,593	443,734
March	610,678	543,711
April	585,705	569,728
May	721,161	508,101
June	897,864	523,689
Six Months	3,941,883	3,034,055
July	746,771	604,351
August	842,304	678,092
September	744,982*	657,073
October		601,021
November		474,731
December		384,318
Total		6,533,641

Weekly Estimates

Week Ended	1950	1949
Sept. 30	187,030	151,593
Oct. 7	177,853	148,443
Oct. 14	175,909	146,566
Oct. 21	185,000	143,049

Estimates by Ward's Automotive Reports

* Preliminary.

BUZZZZ: For 1951, Hudson Motor Car Co. has four lines of cars lead by an entirely new series—the Hornet. It is powered by a new high-compression H-145 engine and has a wheelbase of 124 inches. Besides the Hornet, Hudson produces a Commodore Custom, a Super Six Custom and a Pacemaker Custom series. The Hornet, like the others in the line, has the "step own" design with recessed flooring

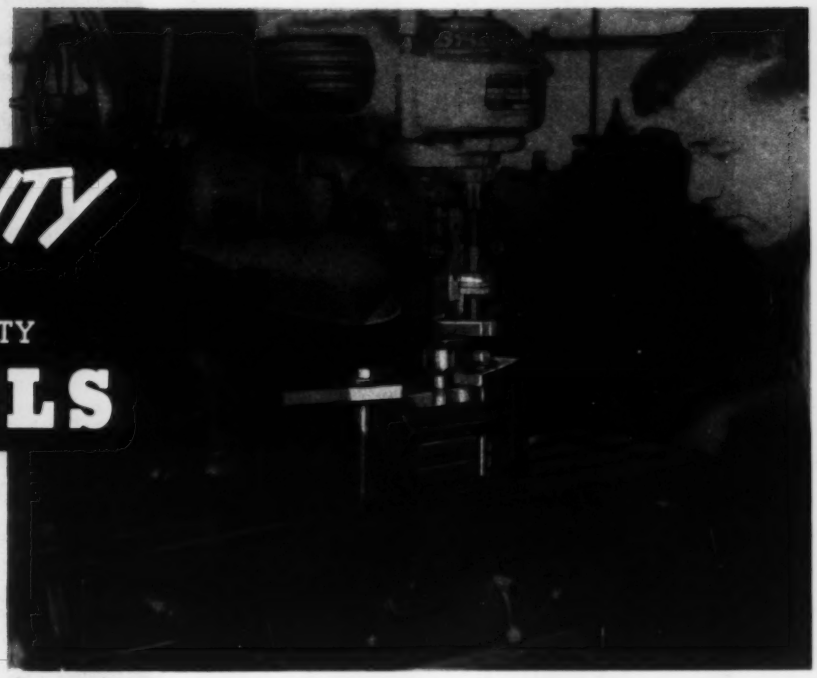
MERC-O-MATIC: Using Ford Motor Co.'s new automatic transmission, the Merc-O-Matic, as optional equipment, the 1951 Mercury features many changes. Combining a torque converter and a three-speed transmission, the Merc-O-Matic provides the equivalent of a four-speed unit. A new grille and front end trim, new rear fenders and quarter panels, new bumpers and larger rear window are exterior changes

FULL UNIFORMITY

MEANS

IMPROVED MACHINABILITY

IN **DIE STEELS**



Machining Cobalt Chrome Die Steel at Brooke Russell Products.

LATROBE DESEGATIZED*

BRAND

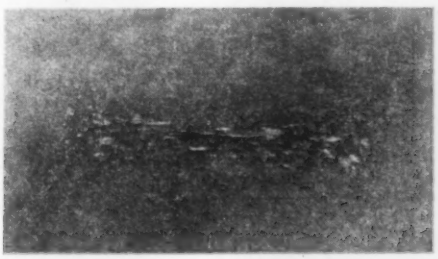
HIGH SPEED STEELS

●

HIGH CARBON–HIGH CHROMIUM DIE STEELS

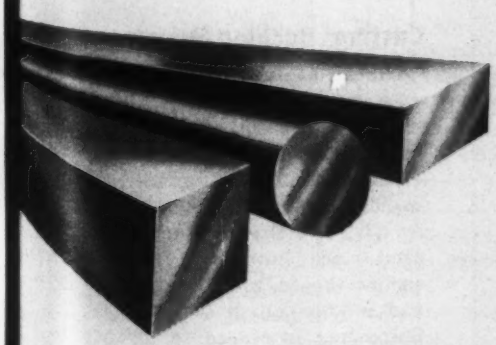
MACHINABILITY—AN IMPORTANT FACTOR! The full uniformity in Latrobe's Desegatized Brand Steels is a valuable aid to skilled machinists and tool and die makers, and provides experienced craftsmen with a material of superior machinability with which to work. Absence of hard carbide clusters in annealed Desegatized Brand tool steel means easier machining qualities, smoother and more accurate finished surfaces, and the elimination of chattering and tool breakage caused by hard spots in ordinary tool steels.

The uniform cross section of this bar of Latrobe's Desegatized Brand Cobalt Chrome Die Steel means greatly improved machinability with less damage to cutting tools while saving costly cutting time.



Large masses of hard carbide segregates seen in the center of this bar of ordinary die steel cause chattering, rapid tool dulling, and expensive machining time.

*TRADE MARK REGISTERED U. S. PAT. OFFICE

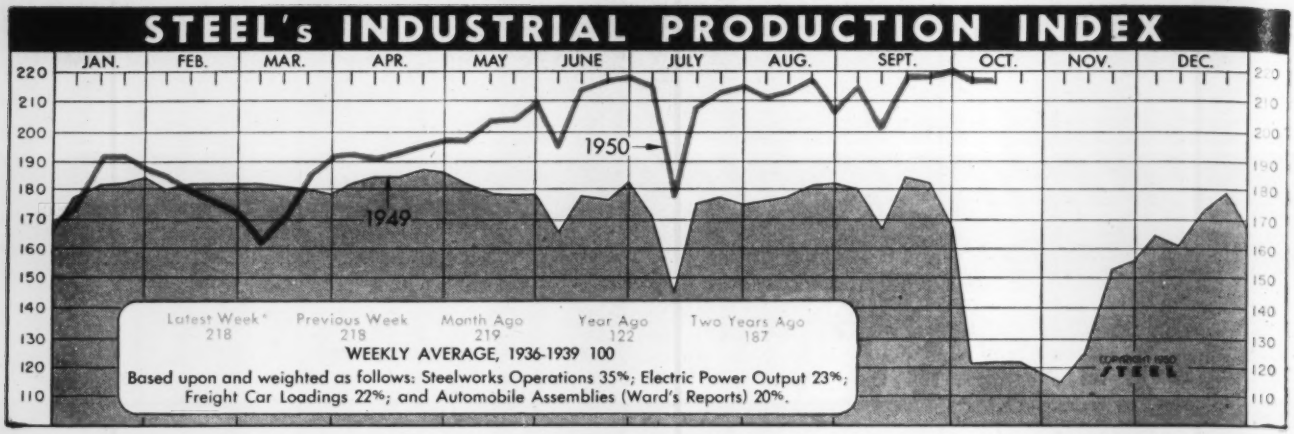


LATROBE ELECTRIC STEEL COMPANY

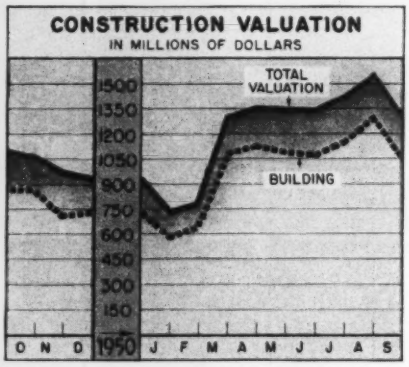
LATROBE, PENNSYLVANIA

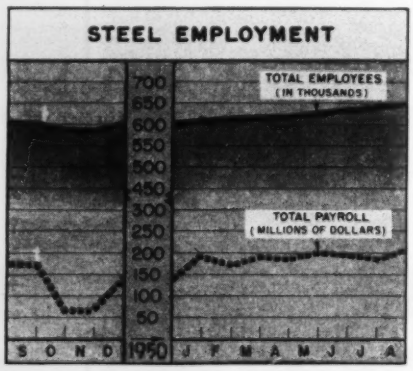
BRANCH OFFICES AND WAREHOUSES LOCATED IN PRINCIPAL CITIES

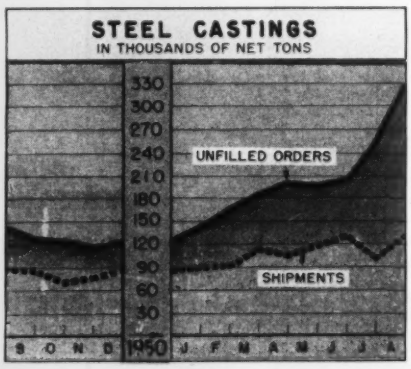
Write or call your nearest Latrobe Sales Engineer for the complete facts on **LATROBE DESEGATIZED BRAND STEELS**



Week ended Oct. 14 (preliminary).







Charts—Copyright 1950, STEEL

Construction Valuation

(37 States)—In Millions of Dollars

	Total		Building	
	1950	1949	1950	1949
Jan.	730.9	483.0	578.8	381.0
Feb.	779.5	568.5	627.0	415.0
Mar.	1,300.2	747.6	1,075.3	579.2
Apr.	1,350.5	842.6	1,123.5	620.2
May	1,347.6	880.3	1,083.0	666.9
June	1,345.5	945.7	1,072.0	706.7
July	1,420.2	943.6	1,162.2	690.9
Aug.	1,548.9	905.7	1,295.1	671.5
Sept.	1,286.5	1,093.7	1,048.3	870.6
Oct.	....	1,061.8	....	857.8
Nov.	....	957.8	....	701.3
Dec.	....	929.0	....	722.2
Total	....	10,359.3	....	7,883.3

F. W. Dodge Corp.

Steel Employment, Payrolls

	Employees in Thousands		Payrolls in Millions	
	1950	1949	1950	1949
Jan.	609	650	$189.3	$202.1
Feb.	613	653	174.7	189.8
Mar.	616	652	190.0	207.2
Apr.	621	647	186.2	191.9
May	628	637	199.9	188.4
June	636	625	195.3	181.8
July	643	610	188.7	160.3
Aug.	649	603	206.6	175.6
Sept.	....	600	....	173.5
*Oct.	....	584	....	63.1
*Nov.	....	584	....	63.1
Dec.	....	602	....	136.9

Monthly average. * Averages taken from single figure for the two strike affected months. American Iron & Steel Institute.

Steel Castings

In Thousands of Net Tons

	Shipments		Unfilled Orders*	
	1950	1949	1950	1949
Jan.	88.8	140.6	142.5	338.9
Feb.	91.8	135.0	165.2	320.2
Mar.	111.8	138.9	185.6	284.8
Apr.	107.0	120.0	201.6	250.5
May	117.9	106.2	198.0	191.5
June	131.1	116.1	206.8	173.2
July	98.3	78.7	255.4	155.5
Aug.	128.4	90.0	329.9	143.6
Sept.	....	86.5	....	127.7
Oct.	....	70.7	....	124.8
Nov.	....	76.4	....	117.9
Dec.	....	84.5	....	122.9

* For sale. Bureau of the Census

Issue Dates of Other FACTS and FIGURES Published by STEEL:

Durable Goods Sept.25	Indus. Prod. Oct.9	Ranges, Elec. Sept.25
Fab. Struc. Steel..Oct.9	Ironers Sept.25	Ranges, Gas Oct.2
Foundry Equip. Oct.9	Machine Tools Oct.2	Steel Forgings Oct.9
Freight Cars Oct.16	Malleable Iron Oct.2	Steel Shipments ...Sept.25
Furnaces, Indus. ..Oct.16	Price Indexes Oct.2	Trucks, Elec. Ind...Jan.2
Furnaces, W. Air ..Oct.16	Pump Orders Oct.16	Vacuum Cleaners....Oct.2
Gear Sales Oct.16	Purchasing Power ..Oct.2	Washers Oct.9
Gray Iron Cast Oct.9	Radio, TV Aug.14	Water Heaters Oct.16

Construction Awards Slip

Although contract construction awards in the 37 states east of the Rocky mountains for September declined from the alltime high recorded one month earlier, they stayed high enough to keep the nine month total well above the same period a year ago. The September award total of $1286.5 million was down 17 per cent from August's record $1548.9 million but was 18 per cent higher than September, 1949. Aggregate for the first three quarters this year reached $11,109.7 million, topping the comparable total for 1949 by 50 per cent.

Awards in the first nine months total more than 1007 million square feet of floor area, 63 per cent more than in the same period a year ago.

All principal award categories were down in September from August peaks but the biggest drop both dollarwise and percentagewise came in residential awards. They totaled $549.6 million in September, were off 27 per cent from the August figure but were 5 per cent higher than in September, 1949. Nonresidential awards totaled $498.7 million in September, 8 per cent less than the August figure but 45 per cent higher than September a year ago.

Public and private works and utilities totaled $238.2 million in September. They too were off 6 per cent from the August total but were 7 per cent above September, 1949.

Castings Backlog Mounts

On an average working-day basis, steel castings shipments in August were 14 per cent above July and 43 per cent above August a year ago. Despite this good production rate backlog of castings for sale grew to 329,944 tons on Sept. 1, highest total since January, 1949. A month earlier the backlog was 255,418 tons and a year ago it was 143,566 tons. Shipments increased to 128,369 tons in August from 98,269 in July.

The Business Trend

Only time will tell how hard automotive and appliance industries were hit by new credit terms. If they need less steel it may help ease the pinch

ANGUISHED cries by automobile and appliance dealers greeted the imposition of tighter credit terms by the Federal Reserve Board a week ago. On the same day leaders in the automotive industry met with NPA officials to discuss how the nation's defense needs can be met. No announcement was made about cutbacks in automobile production following the meeting but if auto dealers fears are justified there will be no need for such an order. Fred O. Haller, president of the National Automobile Dealers Association, asked the Federal Reserve Board to rescind its new regulation on autos because. . . "car sales are already suffering severe curtailment as a result of previous Regulation W terms."

Whether larger down payments and a shorter time to pay will cut deeply into consumer auto and appliance buying is not yet established. Should auto and appliance dealers' worst fears be justified then these industry's flat-rolled steel requirements will be lowered and ease the pinch. So far none of the automobile manufacturers have expressed any worry about getting too much steel. To date they are still concerned about getting enough. Appliance manufacturers too are quiet on this score.

Current production continues on a high plane. In the week ended Oct. 14 STEEL's industrial production index remained at a preliminary 218 per cent of the 1936-1939 average, matching the revised index for the preceding week. A slightly lower auto assembly rate kept the index 2 points below the alltime high. Electric energy distribution and steelmaking rates are at alltime highs.

Steel Record Falls . . .

Steel mills stepped up their operations another notch last week to set another production record but output at the pace maintained in recent weeks doesn't come close to satisfying all the demand. Mills have been operating at or above 101 per cent of theoretical capacity since mid-September and close to that figure for months. Still it is difficult to find any steel consumer who will say he is getting all the steel he needs.

Best Year for Autos . . .

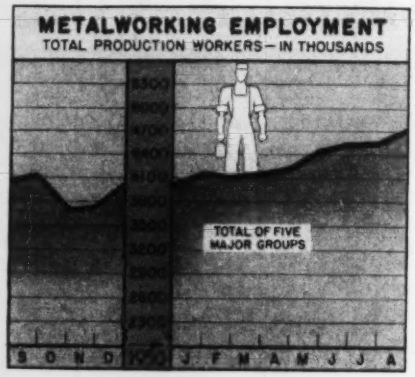
U. S. plants have already topped the 6,258,198 passenger cars and trucks built last year. When the record was set in 1949 many regarded it as a "never to be approached again" total but it was toppled with almost three months left this year. Automakers aren't wasting any time cheering about their accomplishment as they are too busy trying to keep production lines rolling in high gear despite material shortages.

Inventories Higher . . .

U. S. Office of Business Economics estimates that business inventories at the end of August were $55.5 billion. After allowance for seasonal variations the book value of inventories increased $700 million during the month. Manufacturers' inventories were moderately lower than a month earlier but retailers' and wholesalers'

BAROMETERS of BUSINESS

		LATEST PERIOD*	PRIOR WEEK	MONTH AGO	YEAR AGO
INDUSTRY	Steel Ingot Output (per cent of capacity)†	101.5	101.5	101.0	8.0
	Electric Power Distributed (million kilowatt hours)	6,509	6,514	6,449	5,481
	Bituminous Coal Production (daily av.—1000 tons)	1,902	1,904	1,670	357
	Petroleum Production (daily av.—1000 bbl)	5,875	5,872	5,938	5,044
	Construction Volume (ENR—Unit $1,000,000)	$156.7	$288.0	$219.7	$143.7
	Automobile and Truck Output (Ward's—number units)	175,909	177,853	185,421	146,566
	*Dates on request. †1950 weekly capacity is 1,926,803 net tons. 1949 weekly capacity was 1,843,516 net tons.				
TRADE	Freight Car Loadings (unit—1000 cars)	861†	864	866	584
	Business Failures (Dun & Bradstreet, number)	188	154	165	172
	Money in Circulation (in millions of dollars)‡	$27,339	$27,188	$27,151	$27,546
	Department Store Sales (changes from like wk. a yr. ago)‡	+5%	+6%	+8%	−11%
	†Preliminary. ‡Federal Reserve Board.				
FINANCE	Bank Clearings (Dun & Bradstreet—millions)	$14,896	$17,035	$15,066	$10,477
	Federal Gross Debt (billions)	$256.5	$256.4	$258.1	$256.5
	Bond Volume, NYSE (millions)	$15.6	$23.9	$22.7	$14.1
	Stocks Sales, NYSE (thousands of shares)	9,259	13,426	10,890	6,225
	Loans and Investments (billions)†	$68.7	$68.8	$68.5	$66.1
	United States Gov't. Obligations Held (millions)†	$33,694	$33,845	$34,698	$37,252
	†Member banks, Federal Reserve System.				
PRICES	STEEL's Weighted Finished Steel Price Index††	157.29	157.28	156.99	152.52
	STEEL's Nonferrous Metal Price Index‡	225.5	223.1	217.1	170.6
	All Commodities†	168.3	168.8	169.1	152.0
	Metals and Metal Products†	177.5	177.1	176.0	167.3
	†Bureau of Labor Statistics Index. 1926=100. ‡1936-1939=100. ††1935-1939=100.				

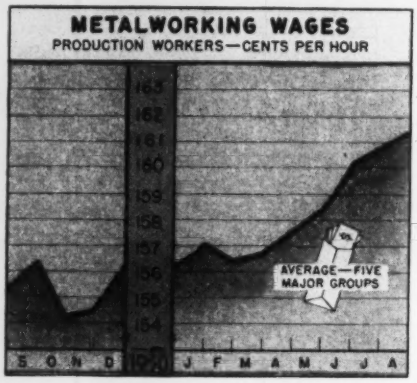


Metalworking Employment

Production Workers—Five Major Groups

1949	Prim. Mtls.	Fab. Prod.	Mach- inery	Elec. Mchy.	Trans. Equip.
Aug.	932	688	927	507	998
Sept.	938	708	935	531	1,017
Oct.	559	677	922	548	986
Nov.	737	666	908	546	898
Dec.	955	988	929	558	896
1950					
Jan.	963	693	936	561	978
Feb.	977	699	959	572	872
Mar.	982	709	981	580	879
Apr.	1,007	722	1,003	595	899
May	1,025	742	1,022	605	1,046
June	1,051	769	1,034	615	1,077
July	1,055	770	1,032	623	1,068
Aug.	1,089	810	1,064	665	1,106

Bureau of Labor Statistics

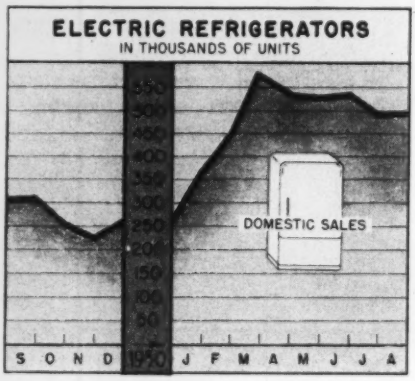


Metalworking Hourly Wages

Production Workers—Five Major Groups

1949	Prim. Mtls.	Fab. Prod.	Mach- inery	Elec. Mchy.	Trans. Equip.
Aug.	158.1	146.8	153.1	145.1	166.0
Sept.	160.7	147.4	153.8	144.7	167.4
Oct.	155.6	145.9	153.6	143.5	165.6
Nov.	158.0	145.1	153.8	143.5	166.2
Dec.	159.7	147.2	154.3	144.6	168.4
1950					
Jan.	161.5	148.8	154.7	144.3	168.2
Feb.	160.2	148.1	155.2	144.5	167.7
Mar.	160.4	148.0	156.0	144.3	167.8
Apr.	160.9	148.8	156.9	144.6	170.6
May	161.9	149.5	157.6	145.3	169.8
June	163.0	151.4	158.3	145.0	172.3
July	164.6	152.2	159.4	146.9	172.4
Aug.	164.4	152.7	160.3	148.2	172.4

Bureau of Labor Statistics



Electric Refrigerators

Domestic Sales—Units

	1950	1949	1948
Jan.	364,002	380,853	272,121
Feb.	450,751	337,424	281,580
Mar.	572,691	369,216	338,109
Apr.	531,498	324,370	330,720
May	528,506	330,753	317,763
June	534,489	296,199	373,115
July	490,802	315,444	351,094
Aug.	496,486	307,622	281,345
Sept.	.....	309,429	344,260
Oct.	.....	252,580	380,854
Nov.	.....	221,221	374,470
Dec.	.....	259,158	330,660

National Electrical Mfrs. Assoc.

Charts—Copyright, 1950, STEEL

inventories moved up $600 million and $300 million respectively. Inventories held by durable goods dealers were $100 million higher than at the end of July. Automotive parts and accessories group accounted for the greater part of the increase in durable goods inventories.

FRB Index Up . . .

Federal Reserve Board estimates its industrial production index kept rising in September to 213 per cent of the 1935-1939 average. The estimate was made for the President's Council of Economic Advisers for inclusion in their monthly report to Congress. It is the highest point ever reached in what is nominally a peacetime period. The council also estimates that corporate profits after taxes were at a $23.2 billion annual rate in the third quarter, compared with $20.3 billion in the preceding period. In the third quarter 1949 corporate profits were at a $17.3 billion annual rate.

Prices Ease Again . . .

After climbing steadily since the outbreak of the Korean war average primary prices in the last two weeks turned downward slightly. In the week ended Oct. 10 the Bureau of Labor Statistics wholesale price index declined fractionally to 168.3 per cent of the 1926 average. The latest figure is 0.5 per cent below four weeks earlier but 10.7 per cent above the corresponding week in 1949. The bureau's metals and metal products index for the same period moved up to 177.5 from 177.1 in the preceding week.

Trade Balance Swings

Imports in August rose sharply and topped exports for the first time in 13 years

DOLLAR value of U. S. imports in August broke all records and topped exports for the first time since June, 1937, as more American manufacturers combed foreign markets for necessary materials and products. General imports rose from $708.8 million in July to $819.4 million in August, a level almost 50 per cent above the $551.9 million monthly average last year and 29 per cent above the monthly average for the first half this year.

August exports of domestic and foreign merchandise were valued at $760.7 million, a slight decrease from the July total of $774.3 million. Excluding the Mutual Defense Assistance Program shipments in both months, August exports were $739.3 million or slightly higher than the $727.3 million July figure. Total August exports were about 25 per cent below the $1003.3 million monthly average for 1949 and 7 per cent below the $815.8 million first half monthly average.

Metals Imports Up—Although the biggest imports increase came in vegetable food products and beverages due to a rise in coffee and sugar imports, industry's seeking for more foreign suppliers did much to swing the trade balance. Metals and manufactures, except machinery and vehicles, advanced to $115.7 million in August from $95.8 million a month earlier. Copper, lead and tin came in larger volume from foreign sources. Larger imports of unmanufactured rubber, vegetable oils and waxes pushed the inedible vegetable products catagory to $77.7 million from $56.6 million.

Machinery and vehicles exports fell from $279.5 million in July to $231.5 million in August to register the largest decrease.

Employment Highest Yet

Non-farm employment in mid-September reached the highest level in history, the Labor Department reports, and will probably go still higher. Employment in non-farm work rose 500,000 during the month to 45.5 million.

Here's how the department sizes up employment developments: Warscare buying and prosperity-propped purchasing forced employers to hire more sales help. Larger consumer demand coupled with increased defense orders from the government meant more orders for manufacturers and they had to hire extra help. On

of the other developments the government hired more help for its expanding defense agencies.

The department notes that shortages of certain skills are starting to appear. Steel mills and foundries in the Pittsburgh area have had to raise the age limit for hiring to 45 and 50 years from 35 years.

Boeing Needs Help

Help in every labor grade is needed by Boeing Airplane Co. even though it hired more than 500 persons for its Seattle and Renton plants in the last two weeks. Employment at the two plants totaled 21,292 a week ago, compared with 17,985 on July 1.

Primary need brought on by more military work is for beginner mechanics, Boeing says. The company is increasing emphasis on its training program to prepare selected men for more skilled jobs.

TV Outturn Climbs

Television output in September was higher than ever before. Not only did it set a new high but almost matched home radio output for that month, the Radio-Television Manufacturers Association reports. September's production was: 817,157 television sets, 831,847 home radios, 356,388 auto radios and 129,070 portable radios. The home radio total was the highest this year.

RTMA totals show 4,963,759 TV sets produced in the first nine months this year. Third quarter output was 1,849,759 for the best quarterly mark to date. September production of all types of radio receivers brought the industry's three quarter total to 10,068,260 units.

DC-6s in Demand

Douglas Aircraft Co. Inc., Santa Monica, Calif., has orders and commitments for 91 airplanes of the DC-6 type including 68 received in the last 30 days, President Donald W. Douglas says. This backlog is valued at about $100 million.

Among international airlines operators ordering the new aircraft are Pan American which bought 18 and Swissair which ordered two. Both airlines will get the larger, faster and more powerful DC-6B models which will also go to American Airlines, United Air Lines and other operators whose purchases have not yet been announced.

Employment, Hours Worked Up

Stepped up production schedules of metalworking plants in the Los Angeles area are boosting employment and hours worked. Employment at 432,000 in August, is up 23,000 from July and is 13 per cent above the like period last year. Hours worked by manufacturing production workers in the Los Angeles metropolitan area averaged 40.5 hours per week in August, the longest work week registered since the end of World War II.

Metalworking Capacity Triples

Production potential of southern California's metalworking plants is three times what it was at the outbreak of World War II. This information was gained in a small machine tool survey recently completed by the Los Angeles Chamber of Commerce.

The survey credits Los Angeles plants with 45,000 machine tools, more new equipment of this type than any of the 18 largest industrial areas of the country. A similar survey in 1941 reported 15,000 pieces of equipment deemed suitable for production of war materials. The just-completed survey showed 22 per cent of the equipment in Los Angeles plants is less than 10 years old.

U.S. Corporations Improve Financial Positions

CONTINUING improvement in the second quarter pushed the net working capital of U. S. corporations to a new record level of $73.8 billion at the end of the second quarter. Securities & Exchange Commission reports corporations' current assets rose by $4.9 billion during the period and were partly offset by a $2.6 billion rise in current liabilities, resulting in a $2.3 billion net gain.

Corporation liquidity, as measured by the ratio of cash and government securities to current liabilities, totaled $44.2 billion at the end of the period and amounted to about 73 per cent of current liabilities. Prewar cash and securities averaged about 45 per cent of liabilities and at the end of 1948 they were 61 per cent of liabilities.

Not Standing Still—In addition to the increase in working capital in the second quarter, corporations invested about $3.9 billion in plant and equipment during the period. To finance this $6.2 billion growth corporations secured about $1.7 billion or a little more than a fourth from external sources. Long term borrowings amounted to about $1 billion while stocks totaled $700 million. Depreciation accruals and undistributed profits provided the remaining $4.5 billion. Cash and bank deposits rose $1.2 billion in the second quarter to $25.9 billion while holdings of U. S. securities moved up $900 million to $18.3 billion. Receivables gained $2.3 billion to $43 billion while inventories and other assets increased $500 million.

Distribution of the $2.6 billion rise in current liabilities was: Notes and accounts payable, $1.5 billion; provision for federal income taxes, $600 million; other current liabilities, $500 million. At the end of the quarter notes and accounts payable totaled $36.2 billion, provision for income tax liabilities $10.3 billion and other current liabilities $13.8 billion.

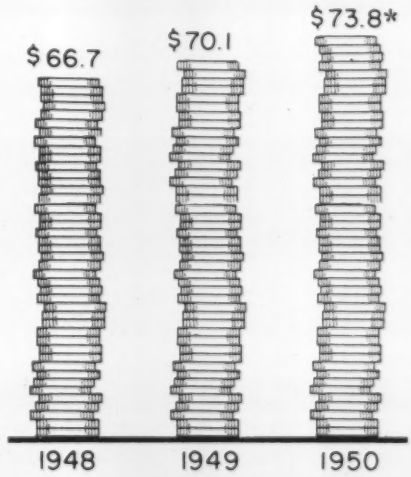
Manufacturing corporations accounted for about 70 per cent of the increase in working capital. All other corporations showed some increase except communications.

Best Yet—Earnings of manufacturing corporations in the second quarter were $3.2 billion, a survey by the Securities & Exchange Commission and the Federal Trade Commission shows. Earnings are the largest for any quarter since the series was started in 1947. Net income after taxes was 34 per cent above the preceding quarter and 59 per cent above the second quarter 1949.

Manufacturing corporations' net sales also reached a record figure, $43.5 billion, in the second quarter. They were about 13 per cent above the first quarter. Costs and expenses increased 11 per cent resulting in an increase in profits after taxes from 6.2 cents in the first quarter to 7.4 cents per dollar of sales in the second quarter. Dividend payments for the second quarter were $1.1 billion, slightly more than in the preceding quarter.

Working Capital Record

. . . $2.3 billion gain in quarter



* End of second quarter.

Men of Industry

PAUL H. DEVANEY
. . . J&L gen. supt., Aliquippa Works

JOHN J. HARDING
. . . new president, Federal Enameling

C. J. GERKER
. . . V. P. and gen. mgr., Midway Tool Co.

Jones & Laughlin Steel Corp., Pittsburgh, appointed **Paul H. Devaney** general superintendent at the Aliquippa Works to succeed **Howard F. Martin,** transferred to the office of the vice president-operations as operations consultant. Mr. Devaney is succeeded by **Alonzo C. Keller** as assistant general superintendent.

Paul L. Lawless, comptroller, **Danly Machine Specialties Inc.**, Chicago, was elected treasurer to succeed **Walter J. Barz,** retired from that position but who continues as a director.

Walter Donnelly was appointed works manager, **Tomkins-Johnson Co.**, Jackson, Mich. He was with Sterling Engine Works, Buffalo.

Kenneth A. Meade, General Motors Corp., Detroit, was appointed director of personnel of the corporation's new technical center near Detroit. **Edwin L. Yates** succeeds Mr. Meade as director of the college relations and personnel placement section of the central office personnel staff.

Robert D. Hill was elected vice president, **Taylor-Wharton Iron & Steel Co.**, High Bridge, N. J., and in addition continues to serve as treasurer.

William E. Mulcahy, recently with Boston Electro Steel Co., has rejoined **Hunt-Spiller Mfg. Corp.**, Boston, as assistant foundry superintendent.

Mead L. Bricker, former vice president and member, administration committee, Ford Motor Co., was elected a member of the board of directors, **Federal Machine & Welder Co.**, Warren, O.

John J. Harding was elected president, **Federal Enameling & Stamping Co.**, Pittsburgh. He succeeds **C. E. Christman,** founder of the company, now chairman of the board of directors. Mr. Harding has served as vice president since 1948, and had previously been president and general manager, Massillon Aluminum Co., Massillon, O., which in 1945 was sold to Ekco Products Co. He remained as president of the Massillon subsidiary and was a member of the executive committee of Ekco until he joined Federal. Other newly elected officers are: **P. M. Burgess,** vice president-sales; **W. T. Christman,** vice president-operations; **C. W. McIndoe,** treasurer; **G. L. Sm.th,** secretary; and **R. E. Shupp,** controller.

William A. Jahn was made assistant to the president, Inland Steel Products Co., Chicago, subsidiary, **Inland Steel Co.** Promotions at the parent company include **W. D. Truesdale Jr.,** named assistant manager of sales in the tin plate and export division; **W. H. Eichengreen,** appointed manager, claim division; and **W. B. Gilmour,** selected manager, commercial research division.

Frank Selway was appointed manager of the plant of **Acco Products Co.**, Ogdensburg, N. Y. He was vice president and managing director of the company's Canadian division.

Ducommon Metals & Supply Co., Los Angeles, steel distributor, elected three vice presidents to deal with problems arising from the rearmament program. They are: **A. W. Lohn,** finance, **Wayne Rising,** merchandising, and **Russell Rising,** sales.

C. J. Gerker was elected vice president and general manager, **Midway Tool Co. Inc.**, Melvin, O. He was general sales manager of the company and will continue to direct sales in addition to management of all factory operations.

S. B. Strom was appointed to the newly created post of comptroller, **Carboloy Co. Inc.**, Detroit. Since 1943 he has been assistant to the president and continues to act in the same general capacity.

D. S. Gibson was elected president, **Crescent Truck Co.**, Lebanon, Pa., to succeed the late **Claude D. Eller.** Mr. Gibson joined Crescent in 1936 and has been chairman of the board since 1948. He continues as chairman. Other officers elected are: **James G. Krause,** vice president and general manager; and **Charles W. Mellinger,** secretary and assistant treasurer.

Frank G. Raichle was elected president, **Sterling Engine Co.**, Buffalo. **Addison F. Vars** was elected chairman of the board, and **Harold W. Burkett,** secretary-treasurer.

Donald E. Randall was appointed manager, Sao Paulo, Brazil, branch of **Independent Pneumatic Tool Co.**

Alton C. Kendall, administrative engineer, lighting division, **Sylvania Electric Products Inc.**, New York, was appointed plant manager for the St. Marys, Pa., incandescent lamp plant.

Bailey Meter Co., Cleveland, appointed the following engineers to branch office posts: **P. K. Bolyard,** assigned

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Ohio MAGNETS

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to Atlanta; **George J. Dunegan,** San Francisco; **L. F. Monahan,** Denver; **R. E. Paulson,** Kansas City, Mo.; and **O. M. Thompson,** Cincinnati.

T. M. Evans, president, H. K. Porter Co. Inc., Pittsburgh, was elected president of **Connors Steel Co. Inc.,** Birmingham, recently acquired by Porter (STEEL, Oct. 16, p. 75). **C. R. Dobson,** executive vice president, H. K. Porter Co., was elected vice president and chairman of the executive committee of Connors Steel.

Dr. Nicol H. Smith was appointed executive director, Franklin Institute Laboratories for Research & Development, **Franklin Institute,** Philadelphia.

J. F. Beckman, for 25 years a member of **Signode Steel Strapping Co.'s** sales staff, was promoted to manager of its New Orleans district.

William H. Morse was appointed manager of the alternating current mechanical engineering section, transportation and generator division, **Westinghouse Electric Corp.,** at East Pittsburgh, Pa. He succeeds the late **A. C. Larson.**

Martin M. Miroff has rejoined **Royal Metal Mfg. Co.** as vice president and general manager of its California plant, and of Hudson Beauty Furniture Co., a subsidiary company located in Los Angeles.

A. L. Carr was appointed to succeed **J. C. Kuhn** as vice president and director of sales, **Morse Twist Drill & Machine Co.,** New Bedford, Mass. Mr. Kuhn, who held the latter position since 1948, has retired. **C. F. Myers,** Midwest district manager, was appointed sales manager. **S. B. Lindh** continues as assistant sales manager.

L. W. Smead was promoted from assistant general sales manager to general sales manager, Ford Division, **Ford Motor Co.,** Dearborn, Mich. He succeeds **Walker A. Williams,** elected vice president-sales and advertising.

A. H. Engstrom was appointed acting engineering manager for American Hammered Piston Rings manufactured by Metal Products Division, **Koppers Co. Inc.,** Pittsburgh. He formerly was assistant to the manager of the American Hammered Piston Ring engineering and research department, **Dr. Tracy Jarrett,** who resigned because of ill health.

Raymond A. Sternthall was appointed manager, Los Angeles office and warehouse, **Chase Copper & Brass Co.** He succeeds the late **T. Franklin Day.**

M. G. Rice was appointed assistant superintendent, LaBelle-Agricultural department, Midland Works, **Crucible Steel Co. of America,** Pittsburgh.

Moore Machinery Co., Los Angeles, appointed **Reg Powell** sales manager of its Los Angeles office. He held that position from 1940 to 1943 when he resigned to establish his own firm.

J. J. Lienhard was elected president, **Wiard Plow Co.,** Batavia, N. Y. He was executive vice president for the last five years.

Richard T. Coyne was appointed vice president, laminate structure sales, **Pressed Steel Car Co. Inc.,** Chicago.

William A. Blume was appointed administrative vice president, **Asbestos Mfg. Co.,** Huntington, Ind. He was formerly president, American Brakeblok Division, American Brake Shoe Co., and vice president of the parent company.

ELTON E. STAPLES
. . . vice president at Hevi Duty Electric

Elton E. Staples, manager of the Cleveland district office of **Hevi Duty Electric Co.,** Milwaukee, was elected a vice president of the company. He joined Hevi Duty in 1940 as district manager in Chicago after 15 years' experience in industrial metallurgical and mechanical engineering sales activities. Mr. Staples continues headquarters in Cleveland and will have charge of all field sales activities.

Gordon W. Johnson, chief metallurgist, American Hoist & Derrick Co., St. Paul, was named supervisor of foundry process research, **Armour Research Foundation,** Illinois Institute of Technology, Chicago.

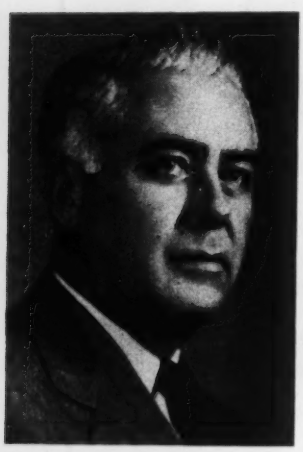
Diversey Corp., Chicago, named **B. W. Powers** district manager for the Chicago area with supervision over all maintenance products department sales representatives in the central division.

Joseph E. Adams was named director of purchasing and planning, **White Motor Co.,** Cleveland.

John B. Hall was appointed railroad representative in Chicago by **Hyster Co.,** Portland, Oreg.

H. S. Everhard was appointed executive vice president, **Caterpillar Tractor Co.,** Peoria, Ill. **E. W. Jackson** and **Ralph M. Monk** were made vice presidents. **William Blackie,** vice president, was named to co-ordinate the administration of company plants at Peoria and Joliet, Ill., San Leandro, Calif., and the new British subsidiary, Caterpillar Tractor Co. Ltd.

S. W. Muldowney, George E. Tribble and **Walter R. Wolf** were elected directors of **Lanston Monotype Machine Co.,** Philadelphia. They suc-



A. L. CARR
. . . Morse Twist V. P. and director-sales

C. F. Myers
. . . sales mgr., Morse Twist Drill & Machine

LOUIS K. WHITCOMB
. . . mgr. product development at Sharon Steel

WILLIAM J. MILLER
. . . Magnetic Metals vice president

CHARLES T. JORGENSEN
. . . president, U. S. Engineering Corp.

ceed **D. S. Hendrick, Elizabeth G. Stirling** and **Dr. J. O. La Gorce,** resigned.

Louis K. Whitcomb was appointed manager of product development for **Sharon Steel Corp.,** Sharon, Pa. In this newly created post Mr. Whitcomb will include the development of new applications for the company's products, end use products, and customers' products, and will perform the same functions for Sharon's subsidiaries. Before joining Sharon Steel as a special representative in 1948 he was connected with Great Lakes Steel Corp., Stran-Steel Division, as a regional sales manager.

Magnetic Metals Co., Camden, N. J., fabricator of magnetic core parts for communications and electronic equipment, appointed **William J. Miller** vice president. Mr. Miller joined the company in 1942 as sales manager. He had been chief engineer, lamination division of Allegheny Ludlum Steel Corp. since 1929.

Lyman H. Allen Jr., formerly assistant chief design engineer in charge of chemical process design with American Viscose Corp., Philadelphia, was appointed chief engineer, **Foster D. Snell Inc.,** New York chemical and engineering consultant.

Charles T. Jorgensen is president of **U. S. Engineering Corp.,** Milwaukee, newly formed (STEEL, Oct. 16, p. 74). He has spent 25 years in the conveyor industry, and for the last seven years was with Palmer-Bee Co. as Milwaukee district sales manager. Other officers are: **J. H. Fletcher,** vice president; **L. F. Miller,** vice president and treasurer; and **R. H. Oberndorfer,** secretary and legal counsel.

Bruce Smith was appointed director of engineering, **Ryan Aeronautical Co.,** San Diego, Calif. He was chief engineer of the airplane division. **W. T. Immenschuh** was promoted to executive engineer.

OBITUARIES . . .

George S. Case, 67, chairman of the executive committee, **Lamson & Sessions Co.,** Cleveland, died Oct. 11. He entered Lamson & Sessions, founded by his grandfather, S. W. Sessions in 1904. He became factory manager in 1912, and served successively as treasurer, vice president, president, chairman of the board, and since 1947 as chairman, executive committee.

J. J. Raskob, 71, former chairman of the finance committee, **General Motors Corp.,** Detroit, died Oct. 15 following a heart attack. Mr. Raskob, who began his career as secretary to Pierre S. du Pont in 1900, had been in retirement since 1946. He stepped out of his industrial role in 1928 to enter the political field.

Arnold C. Kiekhaefer, 67, president, **Kiekhaefer Corp.,** Cedarburg, Wis., and chairman of the board, Kiekhaefer Aeromarine Motors Inc., Fond du Lac, Wis., died Oct. 7.

Clayton S. Farrell, chairman, **Farrell Mfg. Co.,** Joliet, Ill., died Oct. 8. He founded the company, manufacturer of steel tanks, in 1908 and was its president until retirement last December.

Emil H. Mack, 61, assistant sales manager, **Vilter Mfg. Co.,** Milwaukee, died Oct. 11.

Hanne A. Lauritzen, 85, president and treasurer, **Wisconsin Gear & Engineering Co.,** Milwaukee, died Oct. 11. She was the widow of Lars C. Lauritzen, founder of the firm, and took over the business in 1941 at time of her husband's death.

Chester A. Orr, 67, chairman of the board, **Union Metal Mfg. Co.,** Canton, O., died Oct. 10 following a cerebral hemorrhage. He went to Canton in 1925 as a member of a group purchasing Union Metal. He was named vice president and general manager, advanced to the presidency in 1926, and became board chairman in 1937.

W. B. Horton, 53, welding engineer in Chicago for **Lincoln Electric Co.,** Cleveland, died Sept. 19.

Charles A. Geatty, 67, director, **National Lead Co.,** New York, and former manager of its metal department, died Oct. 10 following a long illness. He retired in 1948.

Edward W. Kavanagh, manager, sales and service, railway division, southern region, **Manganese Steel Forge Co.,** Philadelphia, died Sept. 3.

N. H. Boynton, 64, for 40 years associated with **General Electric Co.,** Schenectady, N. Y., in its engineering, advertising and sales departments at Nela Park, Cleveland, died Oct. 11. From 1947 until he retired at the end of 1949 he was a sales consultant in the administrative division of GE's lamp department.

Carl L. Wenger, 49, former superintendent, **Albany Car Wheel Co.,** Albany, N. Y., died Oct. 7.

S. J. Ryan, 52, assistant manager, tin plate sales, **Wheeling Steel Corp.,** Wheeling, W. Va., died Oct. 10 in Chicago.

Rudolph J. Scavuzzo, 45, president, **Nion Instrument Corp.** and **Micro Molding Corp.,** both in Plainfield, N. J., died Oct. 9.

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Production AND Engineering
NEWS AT A GLANCE

CARBON EQUILIBRIUM ESSENTIAL— Carbon restoration is gaining wide acceptance as a means of increasing wear resistance of metal parts (p. 66). But like everything else, the method involves some precautions. Thing to remember is that highest properties of a steel can be realized only by maintaining the carbon level at the surface in balance with that in the metal. A low strength zone on the surface as result of carbon lost during previous hot forming operations means a part inferior in strength and wear resistance.

HOW SOLID ARE SOLIDS?— An exchange of information on basic fundamentals such as what holds solids together and why they are as strong as they are will be made when noted physicists from U. S. and Europe meet at the University of Wisconsin this week. Intensive research with solids is going on all over the world and the conference on applications of x-ray spectroscopy to solid-state problems at the university will allow an interchange of ideas between men in the field. Knowledge of solids is important to metallurgists seeking better metals. The conference is sponsored by the Wisconsin Alumni Research Foundation and the Office of Naval Research.

PRESSING DOES THE TRICK— Few materials are as difficult to draw and form as the alloys composed largely or wholly of nickel and chromium (p. 68). Yet nearly all components that go into the combustion chamber of the Pratt & Whitney jet engine are produced as pressings. Although several draws are necessary to provide the necessary depth of draw on materials that work harden rapidly, diameters, in many cases, are held within plus or minus 0.005 to 0.007-inch—even though blanks are not available commercially within thickness limits closer than plus or minus 0.003-inch.

ACCURACY HELPS OUTPUT— Burn-off and upset accuracy in its welders enables Excel Corp., Elkhart, Ind., to produce trailer coach window frame sash at the rate of 140 per hour. The output is achieved by using two Taylor-Winfield motor-operated butt welders mounted on a common base, with one machine adjustable as to position to compensate for varying sizes of work. Special dies are used to process the preformed sections of cold rolled stainless steel 0.32 to 0.050-inch on the two welders, the precision miter welds being made simultaneously.

IS STAINLESS TEMPERING DIFFICULT?— If you are a heat treater or metallurgist and plan on tempering hardenable stainless steels, you may find the information presented by A. E. Nehrenberg of Crucible Steel very helpful (p. 72). He discusses some master tempering curves that may help you in evaluating the effects of elevated service temperatures on the hardness of quenched and tempered steels. He also mentions a new chart that eliminates mathematical calculations formerly required.

TIP FOR METALLURGISTS— Although textbooks state that metals melt and solidify at identical temperatures, it isn't so according to metallurgists at General Electric Research Laboratory. Examination under special microscopes of droplets of molten metals entirely free of impurities reveals that they solidify at much lower temperatures than they melt. When impurities are added, the melting and solidification points coincide. Selenium, bismuth, lead, antimony, cobalt, iron and palladium have been studied so far, and in all cases the temperatures at which the pure droplets solidified were roughly 20 per cent below the melting points of the metals.

SIZE HELPS CUT COSTS— Usually when something is made bigger — like a 550-ton open hearth—the immediate reaction is "maintenance costs are going to be higher" (p. 78). But this is not true of Weirton's king-size unit. According to W. W. Kompart, combustion and hydraulic engineer at the company, the size of the furnace and the basic brick construction helped reduce rebuilding costs about 25 per cent per ton of steel produced. Size of the unit also was a factor in cutting down on the fuel bill.

A "BLANKET" OPERATION— In galvanizing water tanks at the plant of John Wood Co., Conshohocken, Pa., the tanks—following pickling—are fed automatically down chutes into two small galvanizing kettles, passing through a flux blanket before actually entering the molten zinc. This assures adequate fluxing of both the inner as well as the outer surfaces. When tanks become totally immersed in the zinc, they are manually hooked at one end. This end is then raised slightly above the zinc level and the tank revolved before again being totally immersed in order to eliminate air pockets. An automatic hoist is used to remove tanks slowly from the bath to allow complete drainage.

BILLET BUNDLE BUSTER— A new, practically automatic method of separating billets from the bundle or crane lift at the charging side of a furnace, shear or similar operation is reported by United Engineering & Foundry Co., Pittsburgh. It is suitable for all applications requiring billets up to 30 feet long. The "bundle buster", the company says, takes up to five or more bundles weighing about 15 tons each and separates the billets without need of manual labor. A selector device places the billets on the charging table one at a time in full view of the operator, simplifying inspection.

Carbon Restoration Improves

Surface physical properties, including wear resistance and fatigue strength of steel parts decarburized by hot forming can be greatly enhanced by recarburizing during heat treatment in a controlled atmosphere

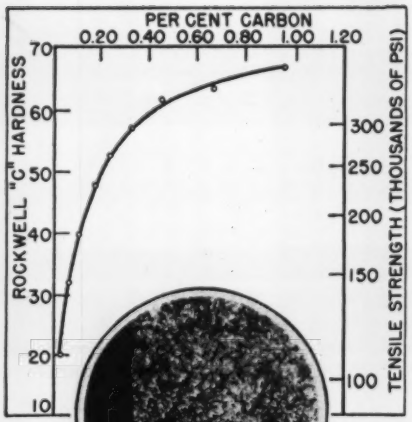

PER CENT CARBON
0.20 0.40 0.60 0.80 1.00 1.20
ROCKWELL "C" HARDNESS
70 60 50 40 30 20 10
TENSILE STRENGTH (THOUSANDS OF PSI)
300 250 200 150 100

Fig. 1 — Effect of carbon content on physical properties of hardened steel is indicated by this plot of hardness and tensile strength against per cent of carbon

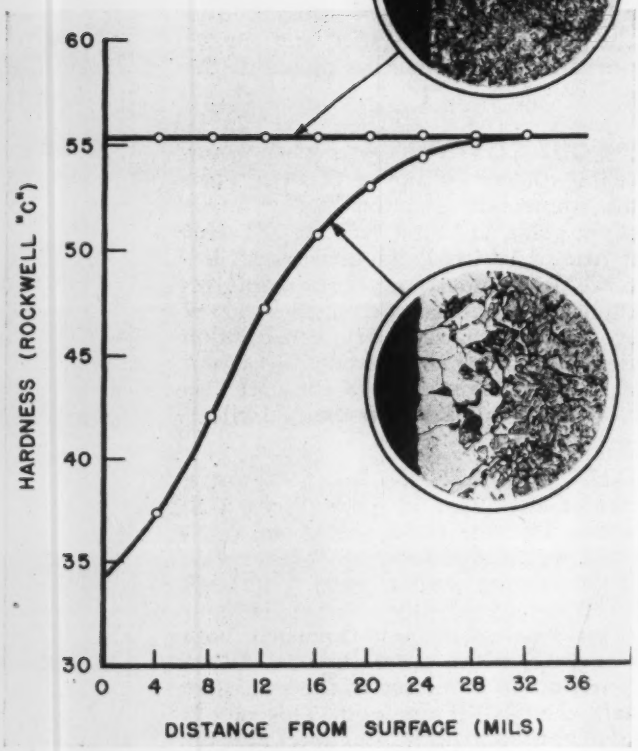


Fig. 2 (above) — Decarburization of spring steel, as shown in the lower photomicrograph, resulted in low hardness and tensile strength in the surface layers. Recarburized and heat treated, the same material showed uniform hardness from surface to core

CARBON restoration by controlled atmosphere methods is gaining wide acceptance as an effective means of improving wear resistance and fatigue strength of steel parts. The process restores carbon lost from the case during earlier hot working, to the level of carbon at the core. The resultant surface has much better physical properties than would exist under the previous decarburized condition.

Why Restore Carbon?—Fig. 1 shows why carbon restoration is needed. It reveals the close relationship between physical properties and carbon content of hardened steel. Maximum hardness obtainable for a given carbon content is shown at the left, and corresponding tensile strength at the right. Both increase rapidly with increasing carbon content. The amount of carbon supplied to the metal surface during heat treatment is governed by the carbon pressure of the atmosphere. This can be regulated so that it is in equilibrium with the carbon that is in the metal.

Only by maintaining the carbon level at the surface can the highest properties of the steel be realized. A zone of low strength in this region as a result of carbon lost during previous hot forming operations means a part inferior in strength and wear resistance.

The steel's wear resistance will be less because of the lower hardness and the strength, especially fatigue, will be lower because of the lowered tensile strength of the skin. Cracks forming here would quickly advance into the body of the part and cause failure.

Decarburization Produces Low Hardness — Fig. 2 shows the effect of decarburization in producing low hardness and tensile strength in the surface layers of a spring steel sample. The decarburized steel after hardening had inferior properties due to this low strength zone.

In the lower right hand corner is shown a photomicrograph of this decarburized material. Lack of carbon as indicated by the absence of martensitic constituents can be seen in the surface areas. Even the region below this which does not show a lack of

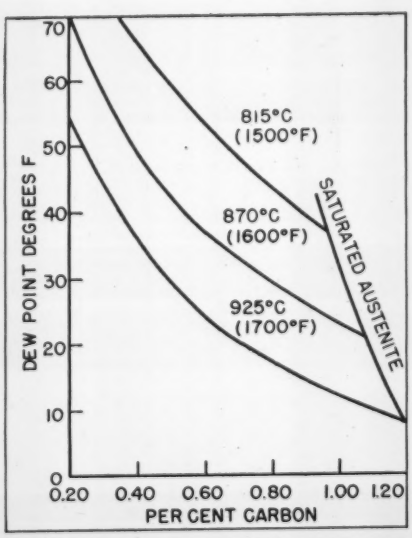


Fig. 3 (left)—Relationship of dew point and carbon content of plain carbon steels for a "20-40" atmosphere. (After Cullen)

Wear Resistance

By SAMUEL DAMON
Materials Engineering Department
Westinghouse Electric Corp.
East Pittsburgh, Pa.

carbon is martensite of a lower carbon content and therefore a lower hardness.

On the other hand, a series of hardness determinations taken on the same material following recarburization and heat treatment shows uniform hardness from surface to core.

Photomicrograph shown at top of chart reveals that carbon is completed restored. In addition to the aforementioned advantages, others are realized, since machining and grinding operations for removal of decarburized surface are no longer necessary.

Carbon Restored During Hardening — Hardening treatments, which in any case should be carried out in a controlled atmosphere, can be made to serve also for simultaneous carbon restoration. To carry out this treatment it is necessary to know the extent of decarburization. A micro or macroscopic examination of a sample of the annealed material will reveal the depth of carbon depletion. An alternative method would be to carry out a hardness survey on a quenched section.

Absorption Increases with Temperature — Once depth of carbon depletion is determined, a decision must be made regarding temperature, time and atmosphere required for carbon restoration. Factors such as the necessity of limiting grain growth, of carrying out a hardening treatment simultaneously must be considered in deciding on the treating temperature. Temperature, in turn, establishes the atmosphere, and has some effect on time, rate of carbon absorption increasing as the temperature increases.

Time is important only insofar as it is necessary to allow sufficient time for complete carbon restoration. Added time of treatment above this will have no effect on the final result since the atmosphere will be in carbon balance with the steel.

Dew Point Controls Carbon Pressure—Equipment for generating the atmosphere reforms a measured mixture of methane and air by pumping it through an externally heated retort that contains a catalyst.

Resultant atmosphere, called Endogas, is piped to the furnace. Analysis of this atmosphere is approximately 40 per cent H_2, 20 per cent CO, 1 per cent CH_4; the balance is N_2 with low percentages of water vapor. Carbon pressure of this atmosphere is regulated by controlling the dew point. By manipulation of the ratio at the generator, or by introduction of methane into the furnace, carbon potential of the atmosphere is matched with carbon content of the steel.

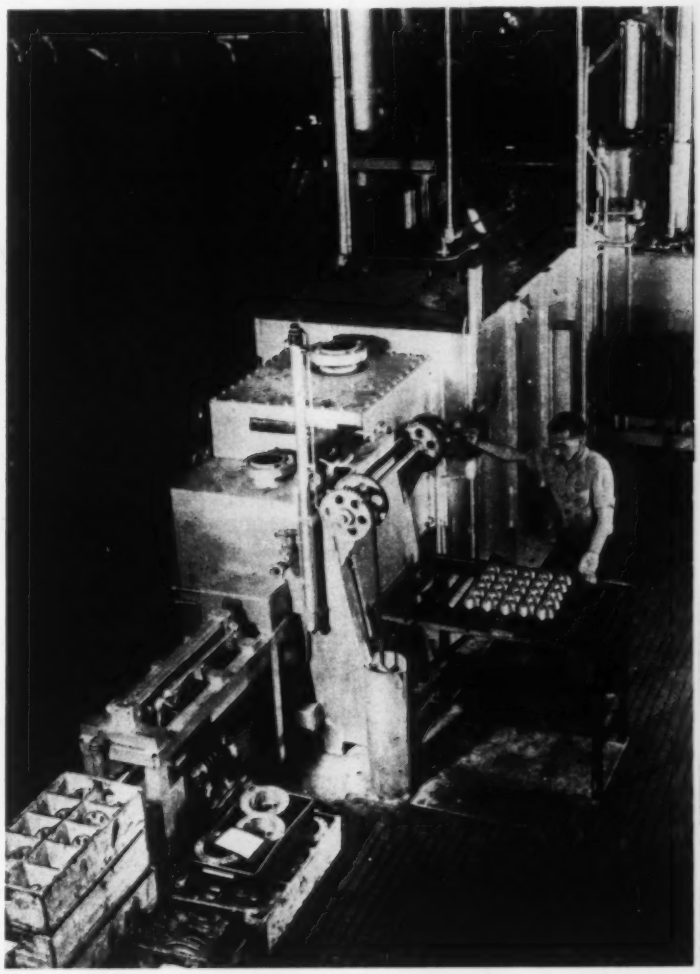
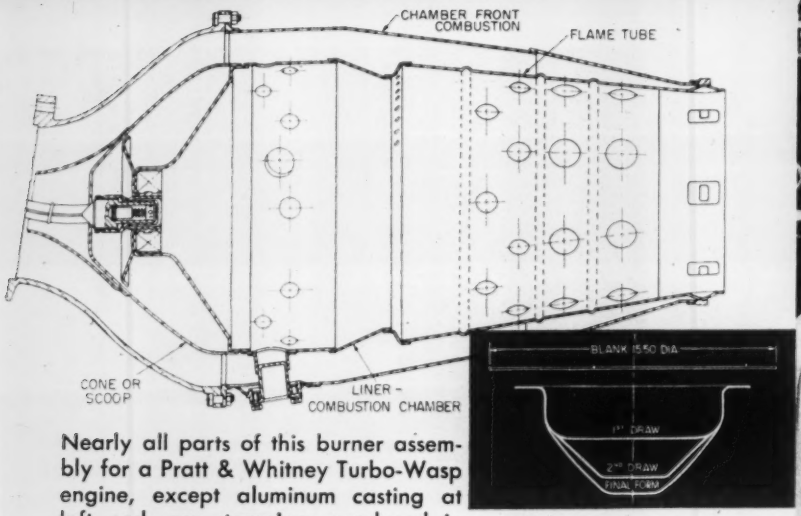


Fig. 4—Type of furnace widely used for bright heat treatment of steels under a protective atmosphere is also suitable for treating raw material or finished parts requiring carbon restoration

Heat Treatment Sets Temperature — Temperature is determined by the treatment desired, i.e. hardening, annealing, or normalizing. Dew point of the gas must be altered to give the proper carbon potential for the given temperature, since carbon pressure of a given gas varies with temperature.

When the temperature is selected and carbon content of the steel known, reference is made to the chart, Fig. 3, for selection of the dew point required in the furnace. When the atmosphere as shown by the dew point is stabilized within the limits required, the carbon restoration treatment can then be carried out.

Type of furnace shown in Fig. 4 is suitable for treating raw material or finished parts requiring carbon restoration. Rate of travel through the furnace is so controlled that carbon content of the surface attains the proper level. Following a suitable additional period to insure complete restoration, the treatment is completed by quenching or atmosphere cooling.



Nearly all parts of this burner assembly for a Pratt & Whitney Turbo-Wasp engine, except aluminum casting at left end, are stampings produced in hydraulic presses and held within close dimensional limits

Superimposed view of the engine's scoop or flame tube as it appears after successive draws from Nimonic stock

Pratt & Whitney Draws Tough A

Aircraft engine parts of 80 per cent nickel and 20 per cent chromium made on hydraulic presses to tolerances that eliminate machining

As told by ROBERT M. TREAT*
To Herbert Chase

FEW materials are as difficult to draw and form as the alloys composed largely or wholly of nickel and chromium—especially the type called Nimonic containing about 80 per cent nickel and 20 per cent chromium.

Yet the work is being done with much success on hydraulic presses in the Pratt & Whitney aircraft plant at East Hartford, Conn. Stainless steels, such as AMS 5510, as well as some of the low carbon types, are worked in similar fashion in the same presses.

Nearly all of these pressings go into the combustion chambers for the Pratt & Whitney Turbo-Wasp JT-6B engine. This assembly is built up almost entirely from pressings save for the supporting aluminum alloy casting at the intake end. As the inner liner of this unit operates continuously at red heat, it must be made from alloys affording maximum corrosion resistance.

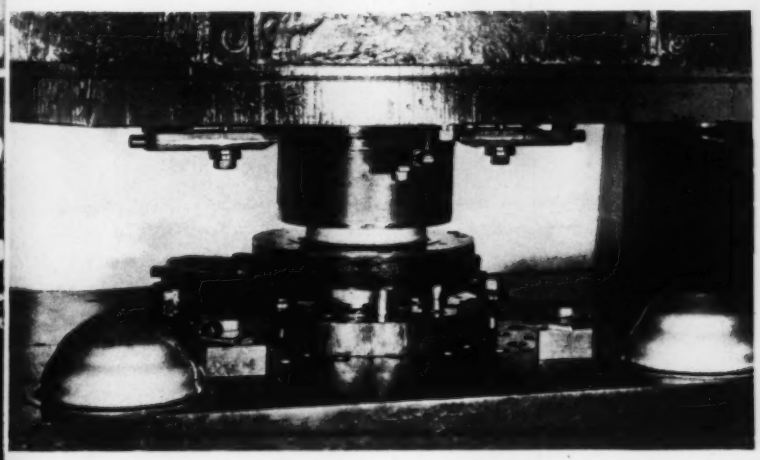
Fits for Welding—Pressings are employed because they are lighter than other products suited to conditions encountered. The outer shell of the assembly is drawn from AMS 5040 low carbon steel because it meets requirements well, is relatively easy to work and is moderate in cost.

Drawn parts for the assembly are unusual, not only because they present difficult drawing problems, occasioned largely because most of the metals are extremely tough and work harden rapidly, but because exceedingly close limits must be held as drawn to avoid machining and yet afford close fits required for welding.

In many cases, diameters are held within plus or minus 0.005 to 0.007-inch, even though blanks cannot be obtained commercially within thickness limits closer than plus or minus 0.003-inch in the thicknesses used. And, spring-back is not easily controlled. So, after allowance for variations in metal thickness, the net tolerance required in drawing is often reduced to plus or minus 0.003-inch or less.

Several Draws Necessary—To accomplish these results and to produce the necessary depth of draw on materials that work harden so rapidly, several draws are commonly required. It also is necessary to bright anneal and pickle between draws. A final strike or sizing operation to give the piece its correct dimensions often is required. As the stock is thin, no machining to size drawn diameters is practical.

* Tool Development Engineer, Pratt & Whitney Aircraft, Hartford, Conn.



Above—Dies employed for making third draw on the scoop; dies in closed position. Drawn parts appear on press bed

Left—Hydraulic press line which includes two 150 and one 300-ton press. Most of the stampings turned out by these units for the Turbo-Wasp engine are of nickel alloy, stainless or low carbon steel

gh Alloys to Close Limits

All drawing conditions are closely controlled as even variations in the type and amount of draw compound applied may vary in size up to 0.005-inch initially. Precautions are taken to minimize the float on press rams, as the large draw dies used do not incorporate guide pins. Press ways for rams are closely fitted to hold ram float within the narrowest practical limits.

In general, drawing is done at the slower ram speeds, partly because press speed is an important factor in holding close limits. Slow ram speed also provides more time for metal flow and minimizes spring back in the drawn part.

Mineral Oil & Tallow—Work is being done not only to find the best draw compound but to control its applications to minimize variations in thickness of the film deposited. A good compound is essential to lubricate the stock in drawing, to protect dies and to minimize die wear.

At present, a draw compound that includes a mineral oil and tallow is used with an admixture of Motor-Mica. This helps reduce friction and die wear. The mixture is applied by brush as thinly and as uniformly as possible adequately covering critical areas. After drawing, the compound is removed in a degreaser before annealing.

Slow Speed Does the Trick—So far, the larger proportion of drawing is done on three HPM presses, of which two are of 150-ton and one of 300-ton capacity. These are arranged to draw at a "slow" speed of 10 inches per minute, although fast traverse is used in bringing the ram to drawing position, and in opening the press after drawing is completed. The presses also have a second action by which pressure on the blankholder is precisely controlled. Both this presure and the ram pressure are set in accordance with definite empirical specification for each draw. Thus, settings are fixed at values which experience has shown to yield good results for each specific part and material surface condition.

A Neutral Atmosphere—Large draw dies used are of Meehanite or a high grade nickel alloy. These afford a good combination of drawing ability and wear resistance. Since dies can be cast fairly close to size, machine work is minimized and costs are moderate. Special efforts are exercised to keep blanks clean and to insure cleanliness of dies, to minimize rejects and die wear.

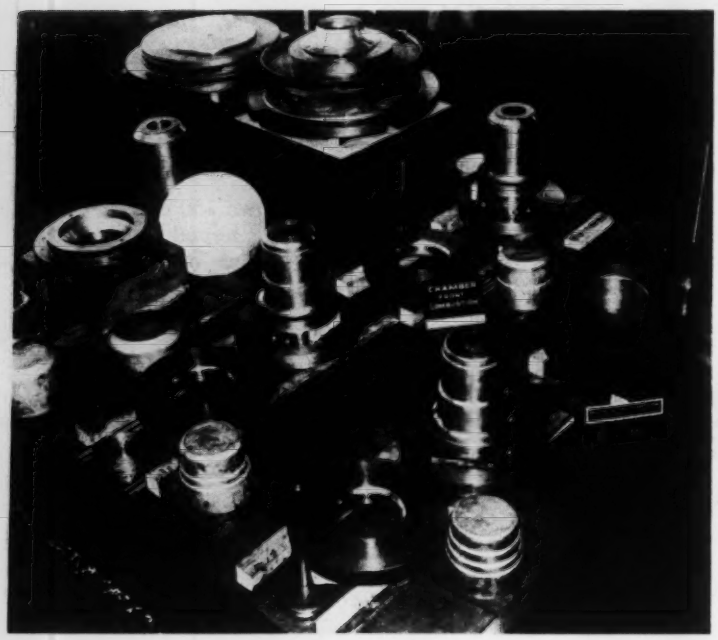
After each draw, drawn forms are first degreased and then are stacked on Nichrome trays on which they are passed, in an automatically controlled cycle, through a bright annealing furnace. A neutral atmosphere is maintained in the furnace as the work moves continuously in succession through a preheat, heating and cooling zone. Temperature is maintained automatically in the heating zone at 1900-1950° F, the work remaining at this temperature for 7 to 9 minutes.

Frequent Pickling—Although parts cool to about room temperature before they are removed from the furnace, there is some formation of chromic oxide on the surface. Unless this is removed, it builds up in successive annealings and causes damage to dies. Thus parts are pickled and cleaned with care following each anneal.

Pickling is done in a solution containing a hydrous

ferric sulphate and hydrofluoric acid heated to 170° F. Nimonic (PWA 673) parts remain in the pickle 15 to 30 minutes and 5510 stainless from 10 to 20 minutes. Pickling is followed by a water rinse and then by a ½ to 1 minute dip in a mild alkali and finally by rinsing in water at 210° F. Baskets are then unloaded and each piece is washed individually with warm water, fed in an air jet, before going back to the press for the next draw.

The "Scoop"—An accompanying illustration shows the class of work done. It indicates the three successive draws on a part called a "scoop" produced from PWA 673 (Nimonic) of 0.048-inch thickness. Major inside diameter of the finished part is held to plus or minus 0.005-inch as drawn, a total tolerance of only 0.010-inch. Minimum thickness cannot be under 0.040-inch at any point on the finished piece. Pressure applied by the ram in the third draw is 110 tons and with 30-ton cushion pressure. The draw is made at a ram speed of 10 inches per minute.



These of nickel alloy cast iron dies are employed in making successive draws on the front combustion chamber. All photos courtesy Hydraulic Press Mfg. Co.

Another part, called the "rear cone" is produced from the same Nimonic alloy, in two draws. Both its inner diameter at the large end and the outer diameter of the small end are held within 0.010-inch limits. These diameters are permitted to be out of round as much as 0.062-inch as the subsequent assembly tends to hold the part in a true round condition.

One Draw & Six Stages—One of the parts produced in a single draw from AMS 5510 or, optionally, from AMS 5570 (stainless) is a combustion chamber outlet ring. This is made in a single draw and, in common with most other parts, is trimmed to length in a lathe operation.

Deepest of the draws made is that for a portion of the outer casing termed the front combustion chamber. This has a finished length of 10.510-10.540-inch and a maximum outside diameter of 11.570-11.580-inch. Stock is AMS 5040 and has 0.043-inch thickness. A 25-inch circular blank is used, and the draw includes six stages.

In this, as in other parts, close limits are held on critical diameters which makes it necessary to have the correct angles on side walls of the die. Minimum thickness must not be less than 0.032-inch. After drawing, the part is stress relieved at 1600-1650° F and any scale formed is removed. Restriking after stress relief usually is done, to hold close dimensions.

More Draws Needed—Data on drawing of other parts might be added but those mentioned in detail are typical of the larger ones. Some of the small parts involve difficult draws partly because of the short radii required and the work hardening properties of the alloys specified. They are produced without trouble when enough draws are provided. Where needed, a final sizing operation is done to help hold close dimensions.

All press setups are made by experienced men who follow setup specifications. Wherever possible, each die is run in a designated press in which it was used previously. This helps to avoid difficulties resulting from press differences.

Unexpected Relationship Found

Discovery of a new and wholly unexpected relationship between superconductivity—the loss of electrical resistance at very low temperatures—and the constitution of atomic nucleus has been uncovered in recent experiments conducted by National Bureau of Standards, Washington 25, D. C. It was found that pure mercury isotope 198 becomes superconducting at a temperature about 0.02 degree K higher than does natural mercury, which is a mixture of five different isotopes having an average atomic weight of 200.6.

As the difference between isotopes depends entirely on their nuclear masses, this shift, which is proportionately quite large for a temperature so near absolute zero, indicates that the nucleus must exert an important effect on the superconducting properties of the metal. It has been generally supposed that superconductivity is concerned exclusively with the properties of electronic configuration outside of the nucleus. However the results of these experiments establish the validity of the nuclear effect beyond question.

Graphite Cuts Gas, Oil Use

Addition of colloidal graphite to crankcase oils has been determined to effect an average savings of 30 per cent in oil and 10 per cent in gasoline in actual road tests on an internal combustion engine. Savings are said to accrue from the fact that the graphite particles adhere to the metal cylinder walls and bearings to a degree that plain oil will not.

They form a "graphoid" film which is far more difficult to wipe dry of oil than bare metal. According to Acheson Colloids Corp., Port Huron, Mich., the graphite surface will support a thinner film of lubricant without rupture than will the metal alone.

Machinery Field

By GUY HUBBARD
Machine Tool Editor

ECHO OF NMTBA MEETING: I have just returned from one of my always memorable visits to Canada, during which I attended the 49th annual meeting of National Machine Tool Builders' Association at Toronto. In addition to being one of the largest meetings ever held by the association, this one struck me as one of the gravest meetings since the one which immediately preceded Japan's strike at Pearl Harbor. Dim lights due to power shortage in the Province of Ontario intensified the feeling that we face momentous events.

The difference between this Toronto meeting and the one immediately before Pearl Harbor lay primarily in the fact that—having been through one great test of strength—machine tool builders today feel more confidence in their ability to cope with whatever lies ahead. If government departments will recognize this confidence and this ability, and take advantage of it instead of smothering it under tangled masses of red tape—all will go well.

To my way of thinking, David Ayr, president and general manager, Hendey Machine Co., Torrington, Conn., in his address as retiring president NMTBA, did a masterful job of explaining why the machine tool industry is stronger and more confident today than it was at the time of the Pearl Harbor episode. "Let's hark back to the National Defense program and the start of World War II," said Mr. Ayr.

"At that time we were told in Washington that we would have to run our plants right around the clock. We said we couldn't do it. Then we went ahead and did it. We were told that we would have to employ women. We spent hours protesting to Washington that it couldn't be done. Then we did it. We were told that a lot of our technical men would have to be drafted. We said we couldn't get out the required production without them. Many of them were drafted. We did manage to get out the production. We were told we would have to expand our plants as well as our production—this to an incredible extent. We said we couldn't do it. Then we did it.

"This time we won't go down to Washington and gripe about why this thing and that thing can't be done. Instead, we will go down to Washington and on the basis of all those experiences in World War II, we will show those people in Washington how things can be done—and done as they should be done."

Here is an honest and straightforward statement by an honest and straightforward spokesman for the basic industry of all defense industries. Washington newspapers please copy.

MASTER MANUAL: As if in response to some remarks which I have made lately about problems involved in "servicing" machine tools, I have just received from Ray Bullard, advertising manager, Bullard Co., Bridgeport, Conn., a copy of his new *Cut Master Service Manual.*

This 174-page masterpiece combines operating instructions, maintenance information and complete listing of vertical turret lathe repair parts, in a way that I never have seen done before. In other words, three big problems which constantly give headaches to sales, service and advertising men, have been solved all at once—and most effectively. Having been a victim of these headaches myself for many years, I have more than ordinarily full appreciation of the effective manner in which Ray Bullard has cured them.

One interesting thing about this book is that the usual highly retouched and expensive photographs play no part in its makeup. All of the numerous illustrations are line drawings and mighty effective drawings they are. Some of them—as in the instruction for crane lifting of the machine tools—are shaded perspective drawings. Others—as in the case of hydraulic and lubrication systems—are diagrammatic presentations in colors.

The bulk of the illustrations, however, are good old-fashioned assembly drawings—simplified and lightly shaded so that anyone with even rudiments of mechanical training can understand what they are all about. These last, with the help of thin red lines leading to reference or key numbers on the margin of the pages, take care of the identification of parts in a simple index in the back of the book.

In the operating and maintenance section of the book, verbiage is simple and to-the-point, the story in the main being told by the drawings. I am not too sure but what people without knowledge of the English language can get along all right with this book. Certainly those whose knowldege of English is limited can use it effectively—the language of simple mechanical drawings being a sort of universal one.

This is an expensive book. The Bullards are machine tool builders, not book publishers. My review of their book is a tribute to the Bullard company's ingenuity in dealing with the difficult problem of servicing modern machine tools. Therefore, please don't embarrass me and Ray Bullard by requests for copies unless you are a "Cut Master" user. In that case I know you will be well taken care of by my good friends in Bridgeport.

ROLLING LEAD SCREW COVERS: While I was in Toronto, some of my friends at Canadian Fairbanks-Morse Co. Ltd., escorted me down to visit their fine new office building and show room.

On their demonstration floor was an English-built engine lathe featuring something new to me—rolling steel covers over feed rod and lead screw. Attached to the apron at one end and to spring "shade rollers" at head and tailstock ends, these thin bluedsteel curtains do an effective job of keeping coolant, chips and shop coats out of the "works."

Master Curves Simplify Stainless Tempering

Heat treaters and metallurgists planning commercial tempering treatments for hardenable stainless steels will find their task facilitated by master tempering curves. Complex mathematical calculations are eliminated by a new chart

By A. E. NEHRENBERG
Supervisor of Research Laboratory
Crucible Steel Co. of America
Harrison, N. J.

PRACTICAL application of master tempering curves is now extended to the hardenable stainless steels, types 410, 416 and 420 and to a number of common high alloy hot work steels. Besides the curves, a new chart now eliminates all the mathematical computations formerly required. The master tempering curves themselves are particularly valuable in planning commercial tempering treatments and in evaluating the effect of elevated service temperatures on the hardness of quenched and tempered steels.

Temperature and Time Affect Hardness — Both temperature and time affect the hardness resulting from a given tempering treatment. Until recently the effects of these variables had to be evaluated separately. Tables or charts were prepared to show the effect of temperature on hardness for a given tempering time, or to show the effect of time at a constant temperature.

Most of the available data on tempering characteristics of steels show the effect of temperature on hardness for a given tempering time, usually one or two hours. Tempering times used in commercial practice often do not correspond with those for which data are available. In such cases it was necessary to establish by experiment the temperature to be used to produce the required hardness in the time it was desired to use for the tempering operation.

No More Complex Math—Now, it is no longer necessary to consider the effects of temperature and time separately. All combinations of temperature and time which will give the same numerical result when substituted in the expression $T(c + \log t)$, will produce the same hardness[1]. In this expression, T is the absolute temperature, t is the time and c is a constant for the steel in question.

If you know one combination of tempering temperature and time which will give the required hardness, other combinations can be readily obtained by a simple mathematical calculation, provided the value of the constant c is known.

Curves in which hardness is plotted against various numerical values of $T(c + \log t)$, the tempering parameter, are known as master tempering curves since they indicate on a single chart the hardness which would result from the use of any possible tempering treatment. Few master tempering curves have been published to date. Those that are available are for carbon steels and for high alloy tool and die steels[2].

All Steels Have a Constant of 20—Effect of a variation in the constant, c, the master tempering curve—before a master tempering curve can be constructed it is necessary to arrive at a value for the constant, c. The procedure by which this can be done has been described elsewhere[1].

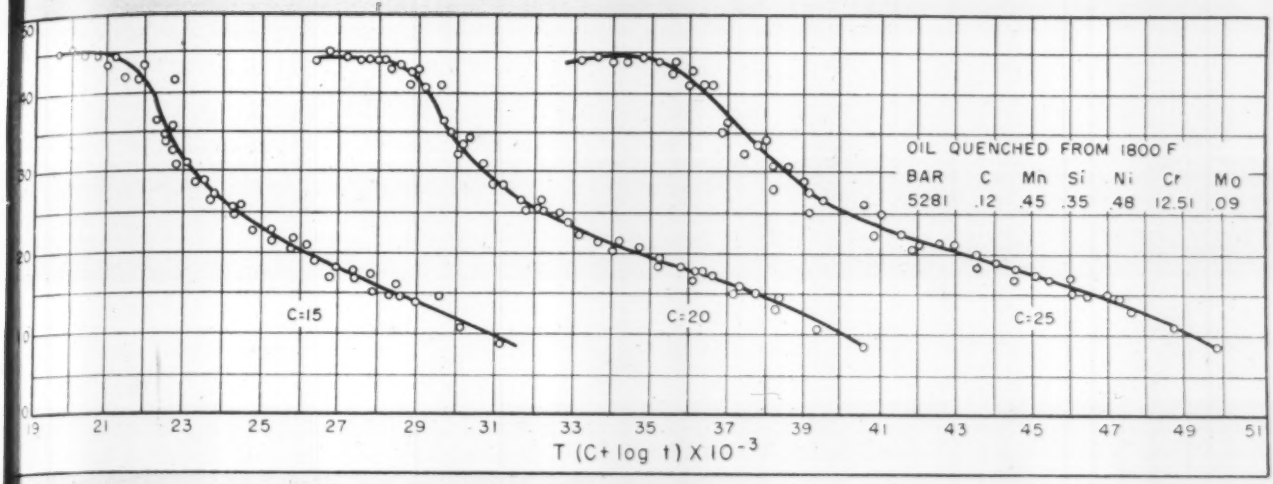
It would be convenient to be able to use the same constant for all steels of the same general type. This would make it possible to assemble all of the master tempering curves on a single chart so that direct comparisons of the tempering characteristics could readily be made.

Fortunately, it is not necessary to arrive at a precise value of the constant, c, in the expression, $T(c + \log t)$. For all practical purposes all steels can be considered to have a constant of 20.

Effect of a variation in the constant used for a type 410 stainless steel is illustrated by Fig. 1. Note that a variation in constant produces a scatter in the data points upon which the curves are based. The optimum value of the constant for this steel is 20 since it produces a minimum scatter. Similar observations on the effect of the constant were also made for the other hardenable stainless steels and for the hot work steels covered by this article. In this way it was established that a constant of 20 could be used for all these steels.

Curves for Hardenable Stainless—Master tempering curves for the hardenable stainless steels, types 410, 416 and 420 are shown in Fig. 2. Type 420 stainless is more resistant to tempering than either of the other grades.

The type 410 and type 416 steels respond alike to tempering except under conditions of time and temperature that will soften these steels to hardnesses below Rockwell C 25. It is probably because of the addition of about 0.30 molybdenum that type 416



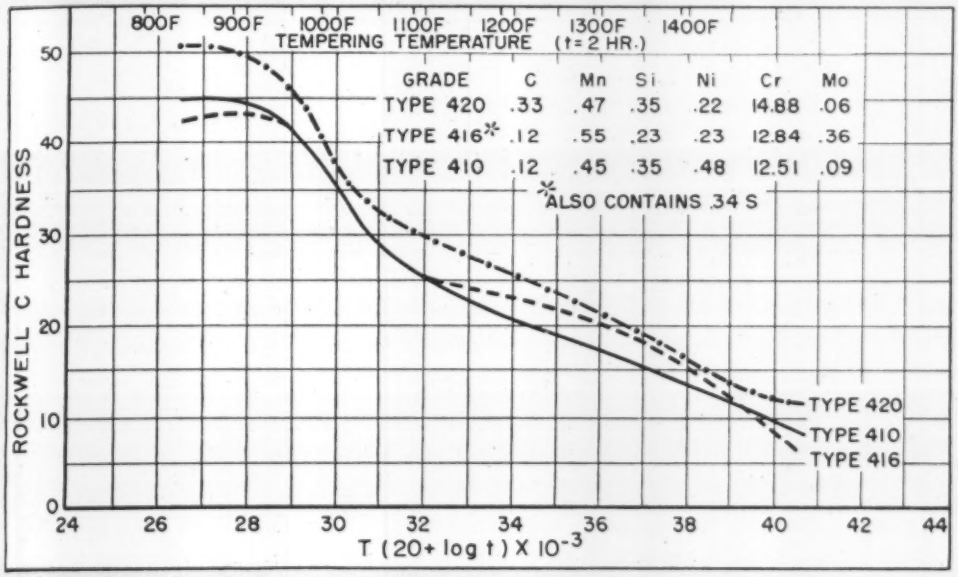

800F 900F 1000F 1100F 1200F 1300F 1400F
TEMPERING TEMPERATURE (t= 2 HR.)
GRADE C Mn Si Ni Cr Mo
TYPE 420 .33 .47 .35 .22 14.88 .06
TYPE 416* .12 .55 .23 .23 12.84 .36
TYPE 410 .12 .45 .35 .48 12.51 .09
*ALSO CONTAINS .34 S
TYPE 420
TYPE 410
TYPE 416
ROCKWELL C HARDNESS
T (20+ log t) X 10-3

Fig. 1 (above)—Effect of C value on master tempering curve for type 410 stainless

Fig. 2—Composite master tempering curve for hardenable stainless steels hardened by an oil quench from 1800°F

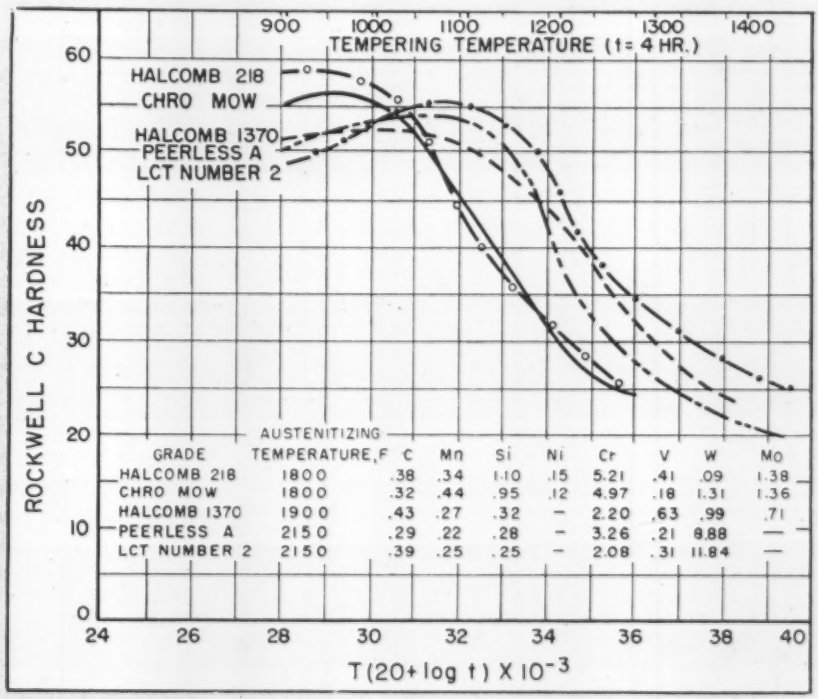

900 1000 1100 1200 1300 1400
TEMPERING TEMPERATURE (t= 4 HR.)
HALCOMB 218
CHRO MOW
HALCOMB 1370
PEERLESS A
LCT NUMBER 2
AUSTENITIZING
GRADE TEMPERATURE, F C Mn Si Ni Cr V W Mo
HALCOMB 218 1800 .38 .34 1.10 .15 5.21 .41 .09 1.38
CHRO MOW 1800 .32 .44 .95 .12 4.97 .18 1.31 1.36
HALCOMB 1370 1900 .43 .27 .32 – 2.20 .63 .99 .71
PEERLESS A 2150 .29 .22 .28 – 3.26 .21 9.88 —
LCT NUMBER 2 2150 .39 .25 .25 – 2.08 .31 11.84 —
ROCKWELL C HARDNESS
T(20+ log t) X 10-3

Fig. 3—Composite master tempering curve for hot work steels

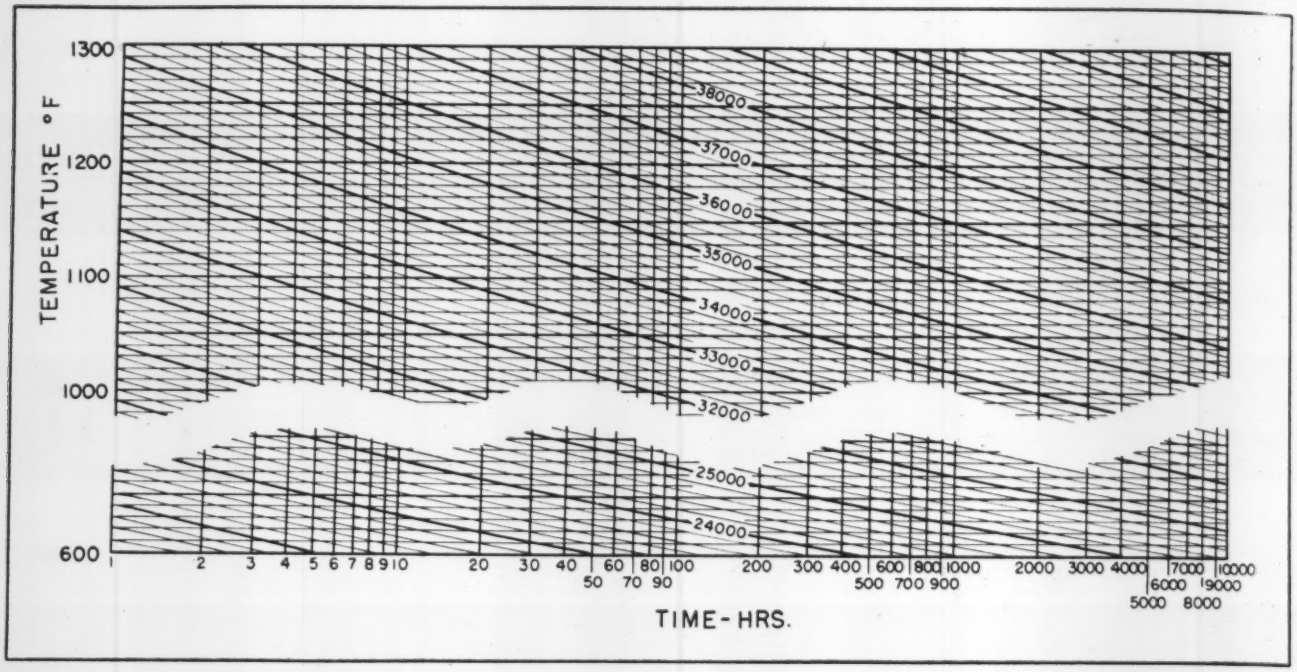


Fig. 4—Chart for determining value of the tempering parameter for various combinations of tempering temperature and time. All time-temperature combinations which fall on the same curved line have the same tempering effect

steel is more resistant than is type 410 to tempering to hardnesses under Rockwell C 25.

Curves Derived for Hot Work Steels—In Fig. 3 master tempering curves for several steels used for hot working applications are shown. All of the steels, except Halcomb 1370, were heat treated to simulate the commercial hardening of 4-inch square blocks; the two 5 per cent chromium steels by an air cool from 1800° F, and the two tungsten steels by an interrupted oil quench after a 2150° F austenitizing. In the case of Halcomb 1370, specimens ⅝-inch square were hardened by an air cool from 1900° F.

Fig. 3 shows that the two tungsten steels, Peerless A and LCT 2, are superior to the 5 per cent chromium steels, Chro-Mow and Halcomb 218, in resistance to tempering. The 12 per cent tungsten steel, LCT 2, is more temper resistant than the 9 per cent tungsten steel, Peerless A.

The new low alloy hot work steel, Halcomb 1370, is intermediate between Peerless A and LCT 2 in resistance to tempering, and is greatly superior to Chro-Mow and Halcomb 218 in that respect.

Chart for Converting Tempering Parameter — A chart by which it is possible to convert the tempering parameter in Figs. 2 and 3 to any desired combination of temperature and time is shown in Fig. 4. This chart is based on a constant of 20. Hollomon and Jaffe[1] presented a chart similar to the one in Fig. 4 except that hardness values were assigned to the various lines. The Hollomon-Jaffe chart is not applicable to steels which exhibit secondary hardening on tempering. This limitation does not apply to the chart in Fig. 4.

Suppose it is desired to temper type 410 stainless to a hardness of Rockwell C 35. Fig 2 shows that the parameter corresponding to this hardness is 30,000. Fig. 4 shows that a parameter of 30,000 corresponds to a 1-hour temper at 1040° F, a 3½-hour temper at 1000° F, a 10-hour temper at 970° F, etc. Any point on the line designated 30,000 represents a combination of temperature and time that can be used to temper the type 410 steel to Rockwell C 35.

Tempering Characteristics Vary—The curves in Figs. 2 and 3 are typical for the various grades, but there is likely to be some variation in tempering characteristics from heat to heat of the same grade. As a result of this, at least one preliminary tempering experiment should be carried out on each heat to establish the amount of deviation, if any, from the master curve.

It is not necessary, in the tempering experiment, to use as long a time as the production tempering operation may require. A temper for about 1-hour at some convenient temperature will establish the tempering characteristics of the heat in question.

Look to the Chart—If the tempering experiment happens to produce the required hardness, then the temperature and time to be used for production tempering can be obtained from Fig. 4. For example, suppose the preliminary test showed that in a given heat of LCT 2 the required hardness of Rockwell C 48 was obtained by a 1½-hour temper at 1225° F. Fig. 4 shows that this temper corresponds to a parameter of 34,000. If it is desired to use a 4-hour temper to produce Rockwell C 48 in this steel in the production tempering operation the temperature to be used is found simply by moving along the line designated 34,000 to the point where the time is 4 hours. At this point, the temperature is found to be 1190° F.

If the tempering experiment does not produce the required hardness, and the data point falls on the master curve, the master curve can be used to ascertain the parameter corresponding to the required

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hardness. Then, the temperature-time combinations which could be used to produce this hardness can be read directly from Fig. 4.

On the other hand, if the data point falls off the master tempering curve, a new curve drawn through this point, parallel to the master curve, represents the tempering behavior of the steel in question, provided the master curve shows a linear relationship between hardness and the tempering parameter. Value of the parameter corresponding to the required hardness would then, of course, be ascertained from the new curve.

How to Predict Hardnesses After Exposure to High Temperatures—Master tempering curves may also be used to predict the effect of elevated service temperatures on the hardness of hardened and tempered steels. This is illustrated by the data in Table I on p.88.

Method by which the hardnesses were calculated is shown by the following example: The hardness of Halcomb 218 was Rockwell C 44 prior to reheating as a result of a 3½-hour temper at 1100° F. The

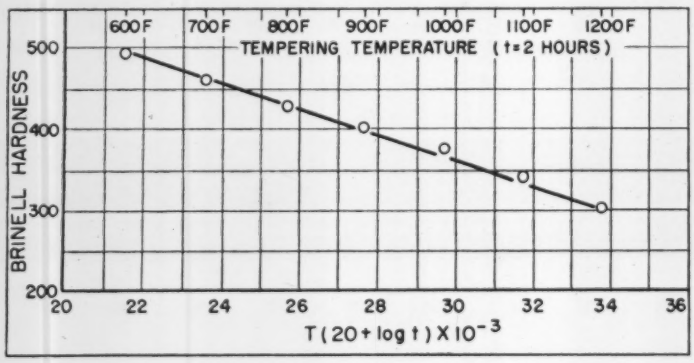

Fig. 5—Master tempering curve for 4340 obtained from published data. Oil quenched from 1500°F in 1-inch diameter section

master tempering curve for this steel in Fig. 3 shows that the parameter corresponding to Rockwell C 44 is 32,100.

Check Effect of Time at Reheating Temperatures—To evaluate the effect of time at the reheating temperature it is first necessary to calculate the time necessary to produce the initial hardness, in this case Rockwell C 44, at the reheating temperature. In other words, time at the reheating temperature equivalent to time employed at the tempering temperature must be determined. This calculation is made as follows:

Tempering Parameter = T (20 + log t) = 1360 (20 + log t) = 32,100

where T, absolute temperature equals temperature in degrees Fahrenheit plus 460.

From which, log t = 3.60

t = 4000 hours.

This means that when reheating of the hardened and tempered Halcomb 218 began at 900° F it had already received the equivalent of a 4000-hour heating at that temperature. A 3560-hour reheating at 900° F corresponds to a total time at 900° F of 4000 plus 3560 or 7560 hours. Parameter at the end of the 3560-hour reheating at 900° F is calculated as follows:

Tempering Parameter = T (20 + log t) = 1360 (20 + log 7560) = 1360 (20 + 3.878) = 32,500

Same Results from Two Sources—The master tempering curve in Fig. 3 indicates that for a parameter of 32,500 the corresponding hardness is Rockwell C 40. Note from the table that hardened and tempered Halcomb 218 reheated at 900° F for 3560 hours was found to have a hardness of Rockwell C 41.

The chart in Fig. 4 might have been used to obtain the same result. An imaginary line drawn through the point corresponding to 3½ hours at 1100° F, parallel to the existing lines, intersects 900° F, the reheating temperature, at about 4000 hours. In this way it is found that 4000 hours at 900° F would have been required to produce the same amount of tempering as 3½ hours at 1100° F. After a 3560-hour reheating at 900° F the total tempering effect is equivalent to 4000 plus 3560 hours, or 7560 hours at 900° F. The chart indicates that the parameter for a 7560-hour temper at 900° F is 32,500. The master tempering curve in Fig. 3 shows that the hardness of Halcomb 218 is Rockwell C 40 when the parameter is 32,500.

Hardnesses Resulting from Complex Tempering Cycles Predicted—Double tempering of hot work steels is recommended because retained austenite is generally present in these steels in the hardened condition. If the same temperature is used for both tempers, the effect of time is additive. That is, two 4-hour tempers are equivalent in hardness effect to one 8-hour temper at the same temperature.

Whenever different temperatures are used for the two tempering treatments the total tempering effect, and hence, the final hardness can be obtained by the use of the same procedure as that described in the preceding section.

Waisman[4] described methods by which the effect of complex tempering cycles on the hardness could be predicted by using either hardness-log time curves or the Hollomon-Jaffe hardness difference chart. The procedure described in this and in the preceding section is not the same as either of those used by Waisman.

How To Construct Master Tempering Curves—The steels for which master tempering curves are presented here are specialty steels which make up only a small fraction of the total volume used in the heat treated condition. Low alloy constructional steels such as 4130, 4140, 4340, etc., are more widely used. Few master tempering curves have been published for steels of this type, but with the aid of Fig. 4 the reader can easily construct master tempering curves using any tempering data which may be available in steel manufacturers' catalogues, or elsewhere.

Data in the first two columns of Table II are typical for a 4340 steel oil quenched from 1500° F in a 1-inch diameter section and tempered for 2 hours at each of the indicated temperatures. The parameters shown above for 2-hour tempers at each temperature are obtained from Fig. 4 by (*Please turn to Page 88*)

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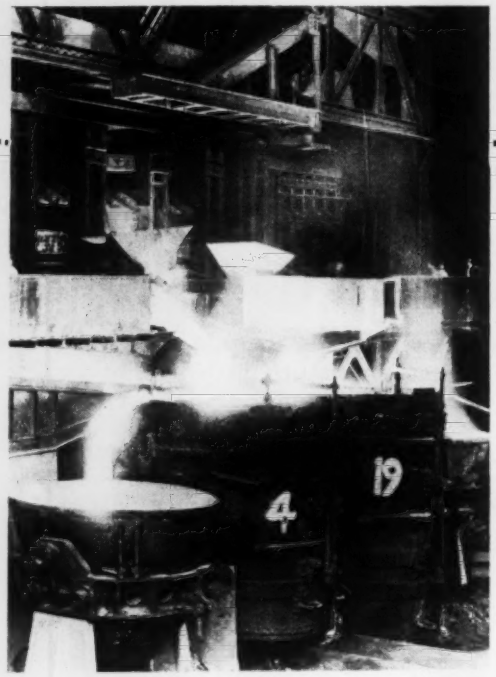

Two ladles are employed to receive 550-ton heats tapped from the world's largest open-hearth furnace

550-TON

Open Hearth Shows Operating Economies

Basic brick construction of Weirton's king-size furnace cuts rebuilding costs about 25 per cent per ton of steel produced. Use of oxygen also reduces tap-to-tap time

By W. W. KOMPART
Combustion and Hydraulic Engineer
Weirton Steel Co.
Weirton, W. Va.

INCREASING steelmaking capacity and reducing cost of making basic steel were motives back of the rebuilding of the No. 1 open-hearth furnace of Weirton Steel Co., Weirton, W. Va., to accommodate 550-ton heats. The work began June 1, 1949 and was completed Sept. 12, 1949. On the first day of operation two heats were tapped, averaging 530 tons. To date, a maximum of 601 tons per heat has been reached.

Construction Helps Cut Costs—Reduction of approximately 25 per cent in rebuilding costs per ton of steel produced is attributed to the use of basic brick construction and size of the furnace. Use of oxygen in the bath is of distinct advantage in reducing tap-to-tap time of heats, although the use of oxygen at the burner to decrease scrap melting time is of no particular advantage due to the length of time required to get scrap into the furnace.

A divider is used to balance the molten metal going into each ladle. This is operated manually to permit a greater or lesser flow of molten metal to either of the two ladles. A stopper rod is used for each ladle. Skulls present no serious problem when properly handled.

Fuel Costs Also Pruned—Furnace size, large checkers and flues and uniform preheated air keep fuel consumption low. Normal shop fuel consumption when using oil or tar is about 22 gallons per ton. On this particular furnace fuel consumed is about 14 to 16 gallons per ton. The fuel reduction is partly due to the size of the furnace and heats, enlarged checkers and flues, and the Isley method of obtaining higher preheated uniform air for combustion and sufficient draft. Air supply is about 30,000 cubic feet per minute and draft at the base of the checkers is a maximum of 2 inches.

Furnace Construction—In the construction of the furnace a 6-inch course of first quality clay brick is used at its center. This thickness increases from the center of the furnace toward each end, reaching a maximum thickness of 12 inches. Above the brick course, there is 13½-inches of chrome brick and then a minimum of 13 inches of Ramix. The backwall slopes and is made up of courses of chrome, Rytex and Ramix to a thickness of about 3 feet. Basic ends were installed on the furnace extending from the port roof to the bottom of the slag pocket. The basic brick extends approximately 13 inches over the port section.

Only One Checker Chamber—Length of the bath at the sill line is 59 feet 4 inches and the width is 20 feet. Seven doors are used on this furnace, each having an opening of 4 feet 4 inches by 4 feet 4 inches.

The furnace was constructed with only one checker chamber to eliminate the walls between the old air and gas checkers. The checker chambers also were deepened to provide a 5-foot 9-inch opening underneath the supporting arches to make cleaning under the checker chambers easier. This both reduces time required for cleaning and provides better draft conditions.

The checker chamber is 31 feet 9½ inches long by 25 feet 6 inches wide by 23 feet 11 inches high as measured from the floor of the checkers to the underside of the roof, The roof of the checkers is of the suspended type. Its main section is 9 inches thick with approximately 12 feet from the slag pocket

15-TON SCARFING BUILDING CRANE

BUILT BY MORGAN Engineering

Illustrated is a Morgan 15-ton, 3-motor, 40′-0″ Span Half Gantry Type Scarfing Building Crane. Hoist is actuated through a worm reduction unit for operating a counterweighted hoist rack connected to two lifting magnets, for handling slabs.

THE MORGAN ENGINEERING CO.

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end 12 inches thick. Two and one half inches of insulation is used on the roof and sidewalls. Width of the checkers necessitated the construction of two exit flues, one 10 feet 5½ inches high by 8 feet wide and one 10 feet 7 inches high by 5 feet 3 inches wide.

Flue Design Speeds Cleaning — These two flues merge into one flue at the base of the Isley stack with an opening of 11 feet 1 inch by 11 feet 7½ inches. The size of these flues was influenced largely by the possible economies obtained in the rapid cleaning of the flues. Flue dust is removed by the vacuum system. Construction of checkers and flues proved satisfactory, as it provided ample checker volume, low draft loss, less time required for cleaning and ample space to collect flue dust—all factors tending to give greater economy.

When the furnace was put into operation, the ladles were of 280 tons capacity and it was necessary to produce heats not greater than 550 tons. Since then ladle capacities were increased whereby it is possible to tap 300 tons per ladle. Present ladles are 15 feet 10⅜ inches high by 10 feet 11¼ inches wide by 13 feet 11¾ inches long with 5 feet 5⅝-inch radius on the ends.

Roof Life Above Average—The first run of the furnace had 166 heats on the roof, and the second run gave 193 heats. The third run gave 123 heats at which time the roof buckled in the front section due to punching the roof with scrap. This roof life is about 50 per cent above shop average and justified the economies expected from a large furnace and this type construction.

The 35 per cent scrap charge is all light scrap. Charging time including all scrap in the furnace varies from 4½ to 6 hours. Installation of basic ends in this furnace has definitely shown economies over the former two uptakes of silica construction.

At the end of each roof campaign, slag is removed from the slag pocket, checkers blown and flues cleaned. Slag removed is much less than formerly and can be readily handled by a traxcavator. Openings are provided for this machine to enter the slag pocket.

Charging boxes used on the furnace are of 42 cubic feet capacity and will handle a maximum of 7500 lb per box. The number of boxes charged per heat varies from a minimum of 150 to a maximum of 300 boxes.

From paper presented at the annual convention of the Iron and Steel Engineers, Public Auditorium, Cleveland, Sept. 26-29.

Motor Cuts Processing Time

Deformation on rolls used in a corrugating machine for processing concrete reinforcing bars is being milled in shorter periods of time since a General Electric type ACA adjustable speed motor has been used on the milling machine. As the deformations in the grooves vary in depth and number depending upon size and type of bar to be rolled, it is necessary to adjust the speed of the revolving cutting head constantly according to the size of the deformation being cut.

Judson Steel Corp., Oakland, Calif., has found that it is possible to make such adjustments in speed quickly and accurately with this motor, thus reducing time required for milling operation. The required cutting speeds in the process are often difficult to determine in advance, but this problem has been solved because the motor may be driven at any speed within its rating by twisting the speed control knob on top of the motor.

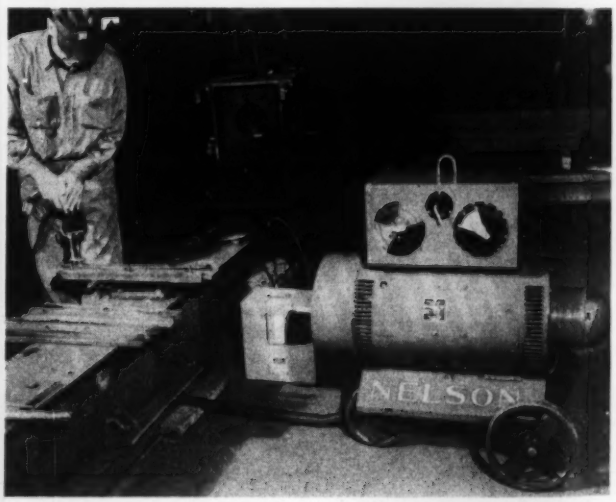
Milling machine is also used to clean the deformations on old rolls. These depressions fill with foreign matter through use, making it necessary to remill them for continued accuracy in the processing of the bars.

Power Units Extend Stud Welding Uses

If you want customers to keep on using your products, the thing to do is to make it easy for them to continue to do so. Operating on this theory, Morton Gregory Corp., Lorain, O., developed two special power units which promise to expand stud welding operations in many new fields.

Specifically designed for Nelson stud welding equipment, one unit is a motor-operated generator set that provides power for welding studs up to and including ⅝-inch diameter. The other is battery-operated unit which furnishes power to install studs up to ½-inch. Both units are designed to provide an adequate power source for stud welding under all operating conditions.

In performance, the power unit shown in the accompanying illustration is equivalent to two conventional 400-ampere generators in parallel, although its cost is about one-third less than the two units. Its size is comparable to a 200 amp welding generator, and it operates from either 220 or 440 volt alternating current.



The battery unit is particularly useful for construction jobs or for plant maintenance operations where necessary welding generators or power are not available. It can be operated two or three days without recharging, and is easily recharged by plugging into any convenient 110-volt alternating current outlet.

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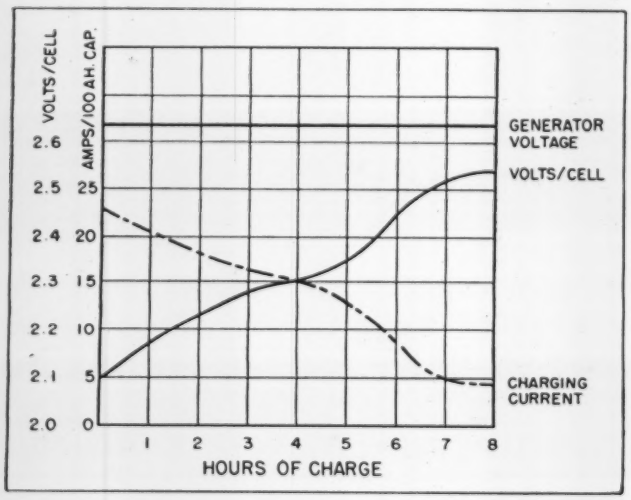
Westinghouse *Life-Line* D-C Motors

Watch Battery Charging

IMPROPER charging of industrial truck batteries results in premature failure. Some authorities estimate that industry loses from ⅓ to ½ its battery capacity because of this reason. Correct charging requires only that direct current be passed through the battary to restore the energy which has been taken from it while performing work.

According to K. A. Vaughan, manager of field engineering, Gould Storage Battery Co., Philadelphia, widely used method of charging industrial truck batteries is the modified constant voltage method which generally employs a constant voltage direct current generator, although a shunt wound generator can be used when single batteries are to be charged. When the constant voltage generator is used, a ballast register is connected in series with the battery.

Charge Tapers Off — At the beginning of the charge, batteries are charged at a high starting rate,



Characteristics of a lead acid battery charged by the modified constant voltage method. Courtesy Gould Storage Battery Co.

this rate depending upon how much the batteries have been discharged. As the battery becomes charged, the charge rate automatically tapers off, since the battery voltage rises and approaches that of the generator. Approximately the last 20 per cent of charge is given at a low finish rate of about 5 amperes per 100 ampere-hours capacity of the battery.

It is determined from the characteristics of the lead-acid battery and by experience that the bus voltage for an 8-hour charge should be 2.63 volts per cell. This, according to Mr. Vaughan, is a little greater than that theoretically required, but is used because it furnishes a stable charging current.

Ampere capacity of the charging generator is determined by the ampere-hour capacity of the battery and the number of units to be charged. For each 100 ampere-hours of battery capacity, the generator should be able to deliver 22.5 amperes.

Shut-Off When Delivered—An ampere-hour meter is one method of controlling the charge, as it measures the product of current and time without regard to voltage. It is set to terminate the charge when the ampere-hours required to bring the battery to full charge is delivered.

Second method of regulating or controlling the charge is by a voltage relay timer. With this method a relay operates the timer when the battery starts to gas at approximately 80 to 85 per cent of full charge. The preset timer automatically terminates the charge at the end of the time period, which is generally 2.5 to 3 hours although it might be greater for older batteries.

Keep Records—Of primary importance to correct charging is the keeping of records. Each battery should be numbered and when brought in for charging, the date, time, vehicle number, battery number, specific gravity of a pilot cell and temperature of a pilot cell should be recorded. This same information should be recorded when the battery is taken off charge. Thus, a complete record of the battery characteristics is furnished which will indicate whether the battery is being correctly charged and whether all the equipment is in correct working order.

Hints Make Motors Last

Electric motors, given the proper care, will operate without trouble for an indefinitely long period of time. Bodine Electric Co., Chicago, recommends the following helpful hints to be applied to the maintenance of fractional horsepower motors: 1. Although small motors usually operate with so little trouble that they are apt to be neglected, they should be thoroughly inspected twice a year to detect wear and to remove any condition which might lead to further wear. Motor bearings, cutouts and other wearing parts should be checked and dirt and dust should not interfere with ventilation.

2. Check the driven load regularly; occasionally additional friction develops gradually within the machine and thus imposes an overload on the motor. Protect them with properly rated fuses or overload cutouts. 3. Inspect the brushes at regular intervals and make replacements if necessary. Whenever one is removed, be sure it is replaced in the same axial position. Brushes naturally wear down and should be replaced before they are less than ¼-inch in length. Inspect the commutator when you inspect the brushes.

4. Do not allow a commutator to become covered with dust or oil. Wipe occasionally with a clean, dry cloth or one moistened with carbon tetrachloride. 5. Take extra care in lubrication of the motor. They should be lubricated according to the manufacturer's recommendation, with enough oil but not too much.

6. Regular attention will make internal switches last longer. Use fine sandpaper to clean contacts and be sure the sliding member on the shaft moves freely. 7. A motor shaft which is out of line with its load will cause the shaft and bearing to wear rapidly, sometimes damaging the driven machine. Watch the motor alignment.

Railroad Car Wheels Bored in Three Minutes

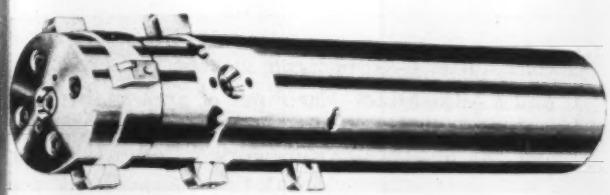
BORING time on cast iron or steel railroad car wheels is reduced from 15 minutes to 3 minutes using a new boring tool equipped with solid tungsten carbide blades. Overall rigidity of the micrometer expansion tool makes possible higher boring machine speeds and feeds.

Four cutters are used in rough boring, two in finish boring and a single cutter for chamfering. According to the Davis Boring Tool Division, Giddings & Lewis Machine Tool Co., Fond du Lac, Wis., manufacturer of the new tool, longer cutter life can be expected with the solid carbide blades.

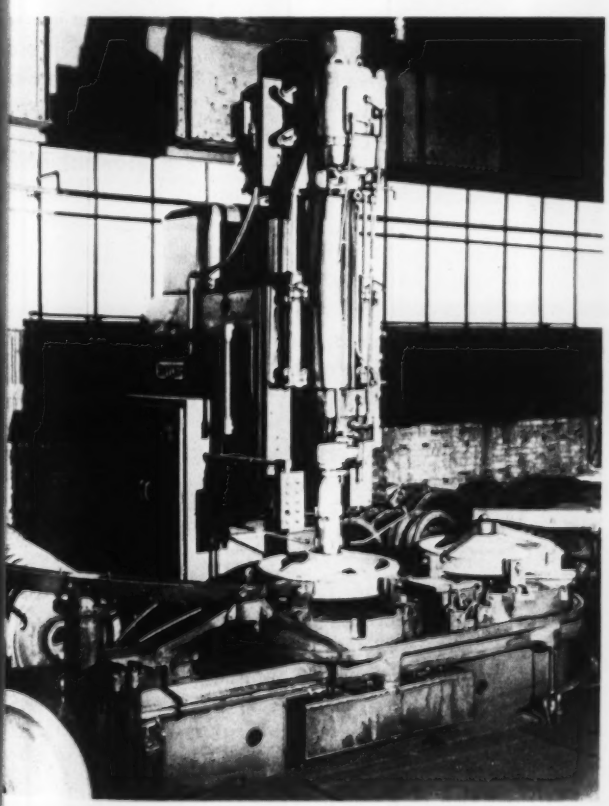
Body of the tool is chrome nickel steel. Cutter slots are held to tolerances within 0.001-inch. Cutter blades are then ground to a 0.0005-inch fit in the holders for full bearing contact. Metal distribution in the boring tool is designed to reinforce the slots and provide ample backing metal for the cutter holders.

Tool is designed for use with high speed boring machines, either the revolving table type with boring tool held stationary or revolving spindle type machine on which wheel remains stationary. In most cases, multiple boring and chamfering operations are completed in a single pass of the tool.

With slight modification, gear hubs, sprockets, bearings, pillow blocks, heavy sleeves, bushings and collars can be bored with maximum accuracy and speed.



Solid carbide cutters in this new tool make possible the use of maximum machine feeds and speeds to reduce wheel boring time



Loading and unloading cycle on this car wheel boring machine is completed while the Davis tool bores and chamfers the wheel in a single pass

Chuck Is Self-Adjusting

When the hand wheel of a wrenchless chuck is turned, the three jaws advance simultaneously until the work has been gripped and automatically centered. Use of this new device, developed by Peerless Machine Co. of Racine, Wis., is said to permit rapid chucking, releasing and repositioning of cylindrical parts as large as 2⅜ inches in diameter. Work held in the jaws may be repositioned or removed from the chuck without halting the spindle rotation.

The part is grasped in the hand and rotated forward faster than the spindle speed to release jaw pressure. As soon as manual rotation is stopped the jaws again come into engagement and the work is instantly regripped. Called the RotoLok chuck, it is available for installation on different types of threading machines where pipes and rounds as large as 2⅜ inches OD must be chucked and released frequently. Pipe or rod as small as ¾-inch OD can be chucked.

Centering and gripping of the stock are by means of three sector-shaped driving jaws pivoted in the center to provide a rocking motion and permit clamping workpieces on either side of the center, at any point on the curved edge of the jaw. Manual rotation of the hand wheel to the right or left will grip the work for right or left hand driving. It is said that jaws will not slip on pipe or rounds during the heaviest cuts. Workpieces as short as 2½ inches in length can be gripped securely for threading at one end.

Handbook on Circular Sawing

Prepared as a guide to the circular sawing of various types of materials is a 24-page, shirt-pocket sized handbook offered by Motch & Merryweather Machinery Co., Cleveland. Intended for use by operators of circular sawing equipment as well as by foremen, supervisors and engineering personnel, it contains information in the form of tables covering the proper selection of saw blades, operating speeds and feeds and tooth angles for sawing ferrous and nonferrous materials.

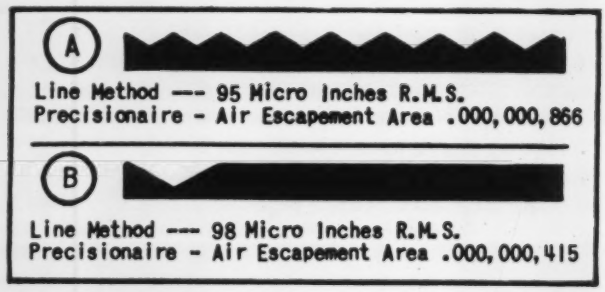
Information on the operation of circular sawing machines and how to overcome difficulties sometimes encountered is included. The first of its two general sections deals with circular sawing of materials, while the second describes slitting and slotting operations.

Finishes on Curved Surfaces Now Measured Accurately

MEASURING surface finish over an area instead of on a line, has several advantages, especially when determining the quality of finish of a bearing surface. For example, it is possible for a sawtooth surface to give much the same reading on an "rms" (root mean square) line measuring instrument as a relatively smooth surface on which there are deep scratches.

A new Precisionaire surface finish comparator would indicate the latter surface as a good bearing surface. But a sawtooth surface would be revealed as unsatisfactory for bearings.

The new comparator, made by Sheffield Corp., Dayton, O., compares surface finish or surface roughness on flat or curved surfaces having a diameter greater than 3¾ inches, where the surface roughness ranges from 30 to 500 microinches rms. The instrument does not give a direct microinch rms reading, but shows a reading which is actually a measurement of the escapement of air over a circle approximately ⅛-inch in diameter.


A
Line Method --- 95 Micro Inches R.M.S.
Precisionaire - Air Escapement Area .000,000,866
B
Line Method --- 98 Micro Inches R.M.S.
Precisionaire - Air Escapement Area .000,000,415

According to root mean square readings, surface A is finer than surface B. Actually, B has twice as much bearing surface as has A. This is realistically indicated by the Precisionaire which shows a two-to-one difference due to the proportionate variations in air escapement areas

The present model gives repetitive readings in the comparison of surface finishes, one finish with another or with a selected standard. It can also be used to establish readings on surfaces to be used as standards. Any number of readings can be taken in quick succession, just as rapidly as the gaging head can be presented manually to the work.

Refractory Arch Is Double-Hung

Sufficiently flexible for attachment to existing steel work is a recently developed double-hung insulated refractory arch. Incorporating the pendulum-hung method of supporting arches that permit the maximum amount of movement without tile displacement, the arch is a development of George P. Reintjes Co., Kansas City, Mo.

The pendulum-hung feature is said to cause each belt of supported tiles to self-align themselves and to resist pressure against outer framework or skewbacks. This is important in movable pit-type furnace roofs, as it reduces overheating of the outer frame and consequent twisting from heated gas leakage.

U and I Adjustable—Each unit of arch tiles is movable, suspended from a tube which in turn is supported from the over-head framework by adjustable I or U bolts. It is reported that this adjustability permits the arch to be aligned to proper contour, regardless of whether the supporting steel framework has been warped or twisted. Contour of the arch can be changed from time to time to meet new requirements, by bending a tube and adjusting bolts.

Horizontal refractory S-lock between the upper and lower refractories prevents the tiles from becoming outwardly disengaged. They do not require compensating pressure from adjacent tiles. This feature is said to eliminate the use of a straight edge or other means of holding any unit in alignment during erection. Normally the upper tiles are made of high tensile strength No. 1 quality refractories, while the lower tiles are made of any grade required by the service encountered.

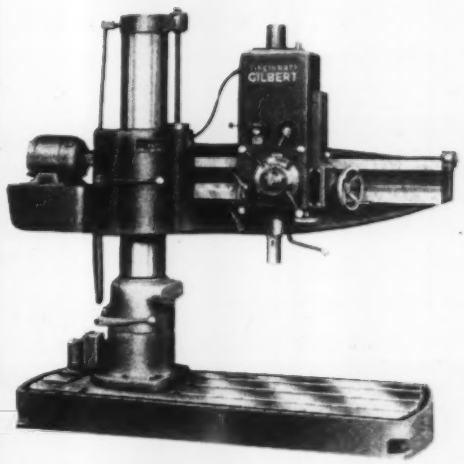
Built into the arch is an expansion feature to absorb the differential expansion between the hot surfaces of the tiles and the interior cooler portions. Arches are also stated to provide special seals for all areas where air infiltration is likely to occur from any source, including tile shrinkage.

Twist Dials, Save Time

Ready reference to facts and figures on plastics and 11 other structural and fabricating materials is provided by a time-saving, pocket-sized comparator, developed by Monsanto Chemical Co., Plastics Division, Springfield, Mass. A twist of the twin dials gives the comparative cost figures on styrene and aluminum, phenolic and zinc, or any contrast of plastics and other materials.

The reverse side gives condensed information on the mechanical, thermal, electrical, optical and chemical properties of 12 leading plastics.

"repeat-business" quality runs in the family



Radial Drilling Machines, 9′′ and 11′′ columns. Centralized controls. Maximum visibility of work. 12 speeds, 6 feeds. Twelve basic features that make these machines the most modern radials you can buy. Write for bulletin 349.

Full Universal Milling Attachment, Rugged Versatile. Swivel and spindle carrier revolve 360°. Spindle nose has No. 50 National Standard Taper.

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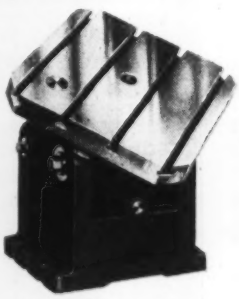
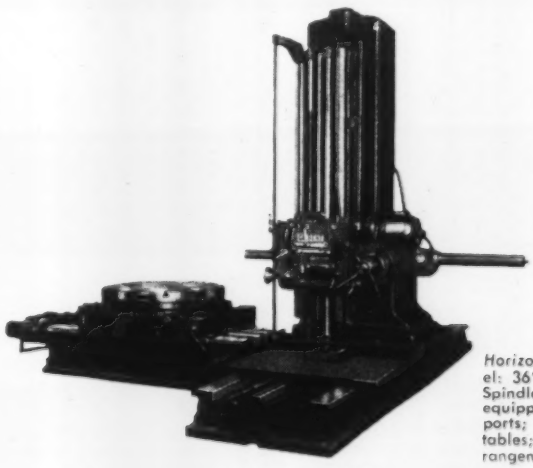
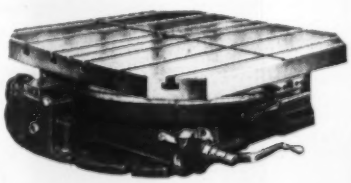
RADIALS • HORIZONTAL BORING MILLS • ACCESSORIES



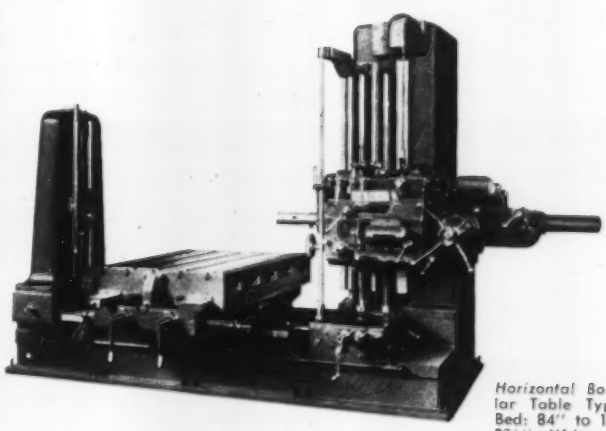
Universal Table. Five sides of a cube can be machined at one setting of work piece. Sizes: 22′′ x 22′′ and 27′′ x 27′′ top. For use on Radial Drills and Horizontal Boring Mills.



Horizontal Boring Mill. Floor type. Head travel: 36′′ to 96′′. Column travel: 36′′ to 180′′. Spindle diameters: 3½′′ or 3¾′′. Can be equipped with floor plates; boring bar supports; stationary, sliding, or built-in rotary tables; revolving columns, and special arrangements. Write for Bulletin 1244.



Rotary Table. Positive accurate indexing device. Worm feed or hand revolving. Square tables 24′′ x 24′′ to 50′′ x 50′′. Round tables 24′′ OD to 50′′ OD.



Horizontal Boring Mill, Compound Rectangular Table Type. Head travel: 36′′ to 72′′. Bed: 84′′ to 120′′. Spindle diameter: 3½′′ or 3¾′′. Write for Bulletin 1040-R. Compound built-in rotary table types also furnished in comparable sizes. Bulletin 348 . . . Write to the Cincinnati Gilbert Machine Tool Co., 3366 Beekman St., Cincinnati 23, Ohio.

THOSE WHO BUY GILBERT BUY GILBERT AGAIN

Master Curves Simplify Stainless Tempering

(*Concluded from Page 76*)

noting the intersections of the vertical line corresponding to a time of two hours with the various temperature ordinates.

The master tempering curve in Fig. 5 results from plotting the above hardness and the corresponding parameter values. This curve is typical for 4340 hardened by an oil quench in a 1-inch diameter section, but it must be recognized that some variation in tempering characteristics will be encountered from heat to heat of the same grade. Hence, it is desirable to carry out a preliminary tempering experiment, as described above, to establish the amount a particular heat deviates from the master curve.

A line drawn parallel to the master curve through the data point resulting from the tempering experiment approximates the tempering behavior of the heat in question over the temperature range from about 600 to 1200° F for which the master curve is a straight line.

TABLE I

COMPARISON OF OBSERVED AND CALCULATED HARDNESSES FOR HOT WORK STEELS TEMPERED TO ROCKWELL C 44-45 AND REHEATED AT 900, 1000, AND 1100° F FOR LONG TIMES

		Rockwell C Hardness							
		Chro-Mow Bar 5569		Halcomb 218 Bar 5572		Peerless A Bar 5571		LCT #2 Bar 5591	
Reheating Temp. F	Reheating Time, hr.	Calc.	Obs.	Calc.	Obs.	Calc.	Obs.	Calc.	Obs.
900	0	..	44	..	45	..	..	..	..
	50	44	44	44	45	..	..	..	..
	95	44	44	44	45	..	..	..	..
	200	44	43.5	44	44.5	..	..	..	..
	345	43.5	42.5	43.5	44	..	..	..	..
	800	43	41	43	43.5	..	..	..	..
	1600	42	41.5	42	43	..	..	..	..
	3560	40	40	40	41	..	..	..	..
1000	0	..	45	..	44.5	..	45	..	45
	50	41	42.5	42	43	44	44	44	44
	95	40	41.5	41	42	44	43.5	44	44
	200	38	40	39.5	40.5	43.5	43	44	44
	345	36	39	37	40	43	41.5	43.5	43
	800	34	35.5	34.5	35.5	41	40	43	41.5
1100	0	..	44	..	44	..	45	..	45
	1	42	42.5	42.5	43	..	..	..	..
	2	41	41.5	42	42	..	..	..	..
	4	39.5	40	40.5	41.5	..	..	..	..
	8	38	38.5	39	40	..	..	..	..
	16	..	..	..	..	42.5	42.5	..	..
	24	34.5	35.5	35	35.5	..	..	..	..
	50	..	..	..	..	39.5	40	42	43
	66	31.5	31.5	30.5	30	..	..	..	..
	95	30.5	30.5	30	29.5	38	37.5	40.5	40
	200	..	..	..	..	35.5	36	38	37.5
	235	27.5	27	26.5	27	..	..	..	..
	345	..	..	..	..	33.0	33.5	35.5	35
	700	25.5	25.5	25.0	25.5	..	..	..	..
	800	..	..	..	..	28.5	29.0	34	..
	1600	24.5	24.5	24.5	25	27.0	26.5	32	30

TABLE II

TYPICAL DATA FOR 4340 STEEL, OIL QUENCHED FROM 1500° F IN A 1-INCH DIAMETER SECTION AND TEMPERED FOR 2 HOURS AT EACH OF THE INDICATED TEMPERATURES

Tempering Temperature	Brinell Hardness	Parameter
600 F	495	21500
700	461	23550
800	429	25600
900	401	27600
1000	375	29650
1100	341	31700
1200	302	33700

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2. G. A. Roberts, A. H. Grobe and C. F. Moersch, Jr.—"The Tempering of High Alloy Tool Steels"—*Trans.* ASM, 39, 1947, p 521-548.
3. P. Payson and A. E. Nehrenberg—"The Metallography and Properties of High Alloy Hot Work Steels"—AISI Yearbook, 1948, p 540-574.
4. J. L. Waisman and W. T. Snyder—"Predicting the Effect of Complex Tempering Cycles"—*Trans.* ASM, 41, 1949, p 1400-1414.

Sulphuric Acid Making Simplified

Seven major items of equipment have been eliminated by a newly developed process for making sulphuric acid. Design is said to be simpler than the conventional contact process and represents an estimated savings of as much as 20 per cent of the present capital cost of an erected medium size sulphuric acid plant in this country.

Commercial-size plant embodying the new design of Chemical Construction Corp., New York, is in operation at the Hamilton, O., works of American Cyanamid Co. Process is the result of the development of a quench converter, bubble absorbers using evaporative cooling and a low cost Pease-Anthony venturi sulphuric acid mist eliminator.

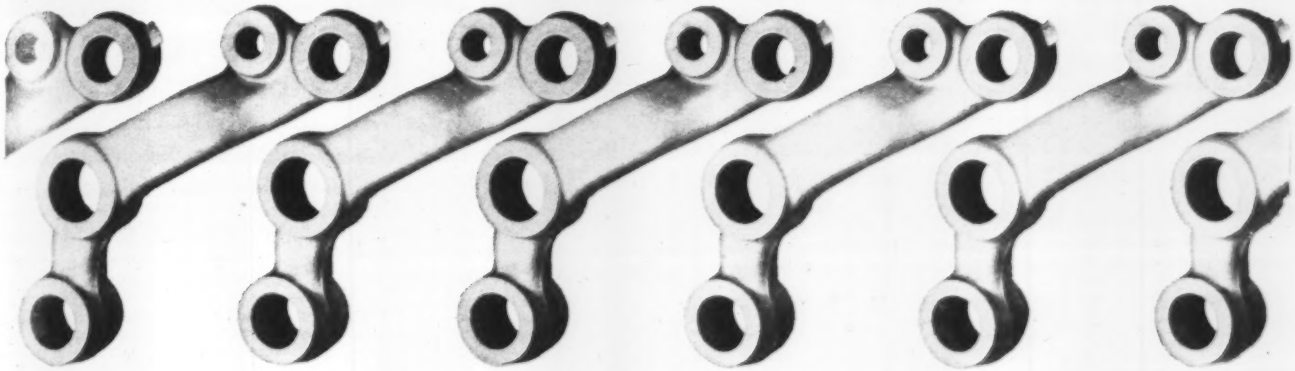
Quench Cuts Corrosion—Inasmuch as the new process uses no drying tower, it was necessary to omit all heat exchange surfaces as potential corrosion hazards. For this reason the quench-type converter was developed for interstage cooling. Catalytic oxidation of sulphuric dioxide is carried out in four successive stages and temperature control is effected by admitting cold, atmospheric air between converter stages.

Probably the most unusual part of the process is the bubble absorber in which the entire heat load provided by the sensible heat of the gases leaving the converter, as well as the heat of formation of the sulphuric acid, is removed by latent heat of evaporation of water vapor in a staged absorption system. It is reported that plants of this design will produce acid up to 95 per cent sulphuric acid strength. It is possible to produce lower concentration without using additional equipment.

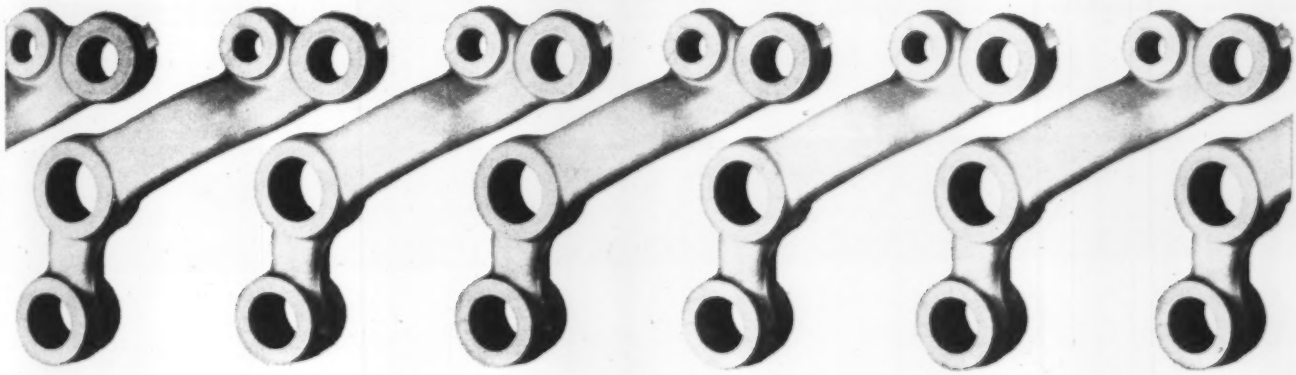
Little Mist Missed—Consisting essentially of a venturi tube, the Pease-Anthony unit scrubs mist laden gases leaving the low stage absorber. This action takes place in the throat at a high velocity by means of a recirculated stream of dilute sulphuric acid solution. The high degree of turbulence prevailing in the venturi throat is said to achieve very intimate contact between gas and scrubbing medium. Practically complete capture of the sulphuric acid mist particles results. Exit gases contain about one-tenth of the acid mist which leaves a conventional absorption tower.

Lists Government Chemical Specs

Latest information concerning chemicals from the government and its contractors may be found on a specification card offered by American Chemical Co., Ambler, Pa. The government specification number and the company's chemical meeting the specification are listed by general types, such as rust-removing and metal-conditioning chemicals, acid inhibitors and pickling, metal cleaning chemicals and phosphatizing, rust proofing and paint bonding chemicals. Also listed are chemicals required for protective surface treatments of industrial metals.



You get uniformity every time



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THE uniform forgeability of Timken® forging steels, plus their superior surface and internal quality, gives you better finished forgings at lower cost.

From bar to bar, heat to heat, Timken forging steels have uniform chemical and physical properties, uniform response to heat treatment, uniform machinability. As a result, your rejects are reduced. You have fewer delays and shop-practice changes to boost costs. And the performance of your forgings is consistently good.

That's *assured*—because Timken steels are tailor-made to your specifications, under the most modern, precise quality control methods known. What's more, every fifth man in the mill spends full time on inspection.

For help with your problems, get an on-the-job analysis by our Technical Staff. No obligation. Also write on your letterhead for our authoritative, 112-page book, "Evaluating the Forgeability of Steels". The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

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CALENDAR OF MEETINGS

† *Denotes first listing in this column.*

Oct. 23-27, National Metal Congress and Exposition, International Amphitheatre, Chicago, sponsored by American Society for Metals. Participating society addresses and Chicago headquarters: ASM, 7301 Euclid Ave., Cleveland, 3, Palmer House; American Welding Society, 29 W. 39 St., New York 18, Hotel Sherman; Institute of Metals Division, American Institute of Mining & Metallurgical Engineers, 29 W. 39th St., New York 18, Hotel Sheraton; Society for Non-Destructive Testing, Skokie, Ill., Morrison Hotel.

Oct. 24-25, Westinghouse Materials Handling Conference, Hotel Statler, Buffalo, N. Y. For further information write Westinghouse Electric Corp., Box 1017, Pittsburgh 30.

Oct. 25, American Iron & Steel Institute: Regional technical meeting, Hotel Thomas Jefferson, Birmingham, Ala. Institute headquarters: 350 Fifth Ave., New York 1.

Oct. 26-28, Audio Engineering Society: Technical sessions and Audio Fair, Hotel New Yorker, New York. Society Address: P. O. Box F, Oceanside, N. Y.

†**Oct. 26-28, National Open Hearth Committee, AIME:** Southern Ohio Section meeting, Deshler-Wallick Hotel, Columbus, O. American Institute of Mining & Metallurgical Engineers is located at 29 W. 39th St., New York 18.

Oct. 27, Malleable Founders' Society: Western Sectional Meeting, Drake Hotel, Chicago. Address of society: 1800 Union Commerce Bldg., Cleveland 14.

Oct. 29-Nov. 1, National Tool and Die Manufacturers Association: Convention, Hotel Statler, Cleveland. Headquarters of association: 1412 Union Commerce Bldg., Cleveland 14.

Oct. 30-Nov. 1, National Lubricating Grease Institute: Meeting, Edgewater Beach Hotel, Chicago. National offices at 4638 Mill Creek Parkway, Kansas City 2.

†**Oct. 30-Nov. 1, Radio-Television Manufacturers Association, Institute of Radio Engineers:** Fall radio meeting, Hotel Syracuse, Syracuse, N. Y. RTMA is located at 1317 F St., N.W., Washington 4, D. C.; the IRE at 1 E. 79th St., New York 21.

Oct. 31-Nov. 10, Short course in quality control by statistical methods, State University of Iowa, Iowa City, Iowa. Further information may be obtained from Lloyd A. Knowler, co-director, quality control program, c/o university.

Nov. 1-2, Porcelain Enamel Institute: 19th annual meeting, Greenbrier Hotel, White Sulphur Springs, W. Va. Institute headquarters, 1010 Vermont Ave. N. W., Washington 5, D. C.

Nov. 1-2, Pennsylvania Society of Training Directors: 4th annual conference, Community Building, Hershey, Pa. General chairman: T. G. Newton, Armstrong Cork Co., Lancaster, Pa.

Nov. 1-3, American Society of Body Engineers: 5th annual technical convention, Rackham Memorial Building, Detroit. Headquarters of society at 100 Farnsworth, Detroit 2.

†**Nov. 1-3, Industrial Management Society, 14th Annual National Time and Motion Study and Management Engineering Clinic,** Sheraton Hotel, Chicago. Society headquarters: 35 E. Wacker Dr., Chicago.

Nov. 2-3, Society of Automotive Engineers: Diesel engine meeting, Hotel Knickerbocker, Chicago. Society headquarters are at 29 W. 39th St., New York 18.

New Products and Equipment

One Man Core Baking Unit

An electronic core baking turntable, operated by one man, is the model 300-T Ther-Monic, developed by Induction Heating Corp., 181 Wythe Ave., Brooklyn 11, N. Y. All components are in one housing. Tubes are water-cooled and manually-operated electrode adjustment is rapid and accurate. Once a setting has been made, it need not be changed for the entire production run.

Unit has a capacity of 350 pounds of sand cores per hour. Cores up to 15 inches wide, 28 inches long, and a maximum combined height of core and core plate of 8 inches may

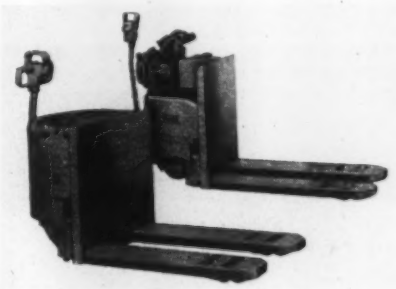
be handled. Seventy-two-inch turntable has speeds adjustable from 0 to 6 feet per minute. Core blowers, rollover machines and benches can be adjacent to the turntable. All fumes are exhausted directly from the core room. Adjustment to power consumption is automatic.

Check No. 1 on Reply Card for more Details

Two Power Type Hand Trucks

Compact design, high maneuverability, accessibility for ease of maintenance, and motor mounted in the drive wheel are features of two power type hand trucks of one basic design, made by Industrial Truck Division, Clark Equipment Co., Battle Creek, Mich. Both are said to have ample under clearance, good tractive ability and large, mechanical, self-energizing brakes.

Battery-powered Electro-Lift model is driven by a General Electric compound motor, developing 1¼ hp. Automatic acceleration prevents over loading of driving motor and dumping of loads. Motor is mounted inside the 14-inch drive wheel. Control panel has two points of power in each direction. In the Hydro-Lift model, a gasoline engine drives the hydraulic pump and motor, which is mounted in the same manner as the electric motor. Automatic torque



multiplication provides ample reserve power when needed. Both models are rated up to 6000 pounds load capacity.

Check No. 2 on Reply Card for more Details

Power Chuck Wrench

Available for application in single spindle machine tools is a power wrench, made by Cushman Chuck Co., Hartford 2, Conn. Reduced loading and unloading time, less fatigue and an unobstructed center hole for bar work are features. Electrical and air controls are fully interlocked with those of the machine to prevent improper operations and to protect both operator and equipment.

Selected jaw pressure is applied by accurate controls. Apparatus is compact and does not interfere with normal tooling and machine operation. With a variable torque control each successive workpiece may be held in the chuck with the same uniform, predetermined jaw pressure.

Check No. 3 on Reply Card for more Details

Roll Handles Pipe Magnetically

Hot galvanized pipe may be moved from the galvanizing kettle to the cooling table by a double pipe roll operating on the magnetic principle, developed by Magnetic Engineering & Mfg. Co., Clifton, N. J. It has two rows of 12 pipe rolls in series, is 24 feet long and weighs about 5 tons. Permanent, as well as electro magnets, are used.

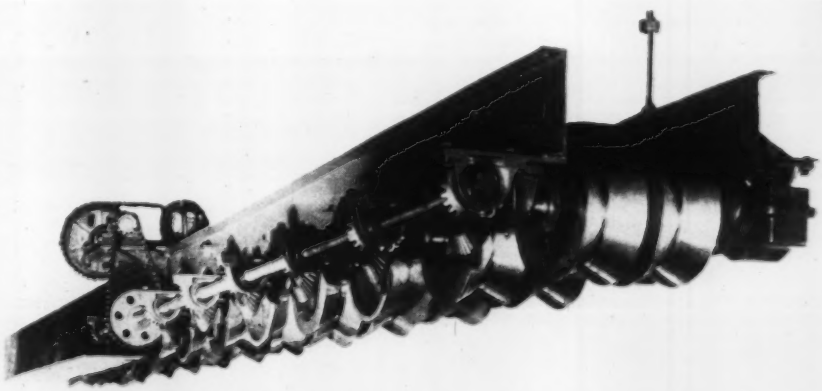
The first two pipe rolls in each row are made with special cast Alnico five heat treated permanent magnets. The other magnetic rolls have electro magnets of higher strength. Permanent magnets are used due to lesser load and high heat at the feed end. Unit illustrated will handle pipe sizes of ½ to 4 inches.

Check No. 4 on Reply Card for more Details

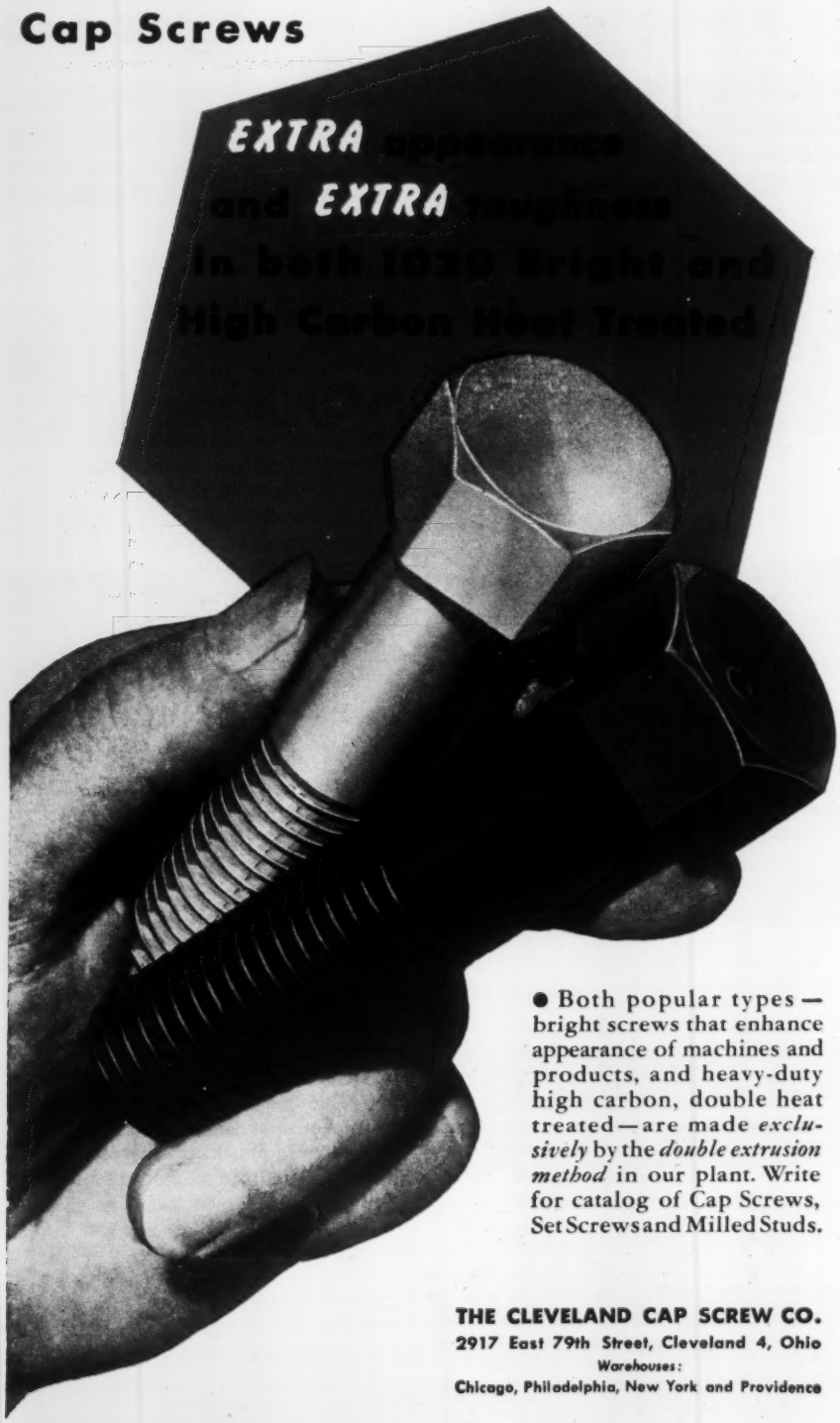
Fractional Hp Dynamometer

Designed to aid in analyzing and demonstrating the operation of fractional horsepower motors, generators and dynamometers is a fractional horsepower dynamometer announced by Special Products Division, General Electric Co. Schenectady 5, N. Y. Equipment also permits testing of

internal combustion engines and other mechanical equipment of similar rating. Use may be for obtaining performance curves on small motors and generators, checking power requirements of small machines such as fans, pumps, and compressors, testing small engine auxiliaries and aiding



More strength for your money in Cleveland Kaufman-Processed Cap Screws



● Both popular types — bright screws that enhance appearance of machines and products, and heavy-duty high carbon, double heat treated — are made *exclusively* by the *double extrusion method* in our plant. Write for catalog of Cap Screws, Set Screws and Milled Studs.

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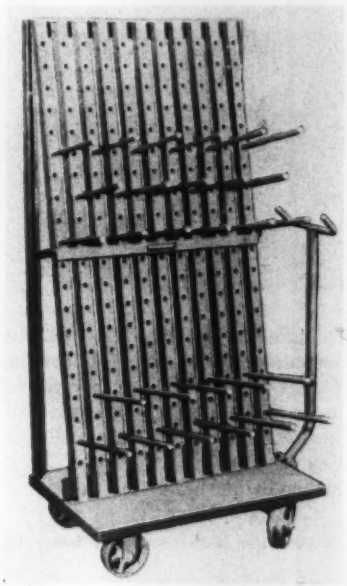
appliance manufacturers in determining proper motor for their equipment.

Unit is self contained with an extended base to allow for mounting of equipment under test. Control panel contains instruments for reading field voltage and armature current, a field control rheostat and a three-way switch for selecting desired resistance loads. A preloaded scale permits direct readings with the unit operating as a motor or generator. It has a continuous absorption or motoring rating of ¾-hp at 2000 rpm.

Check No. 5 on Reply Card for more Details

Peg Conveyor Protects Parts

Machine or polished parts may be handled and protected with an adjustable peg rack conveyor, designed by Rack Engineering Co., Connellsville, Pa. Conveyor brings the work



to the machine operator properly positioned for fast handling. Parts of any size, shape or weight may be handled. Its construction is said to ease floor congestion and reduce accidents.

Check No. 6 on Reply Card for more Details

Three Position Indexer

So versatile that it can be adapted to any job requiring three-position locating, the indexer made by Erickson Tools Division, Erickson Steel Co., 2309 Hamilton Ave., Cleveland, O., eliminates the need for many work-holding devices for various milling, drilling, tapping, punching and similar machining operations. When connected to table controls for fully automatic operation, the indexer af-

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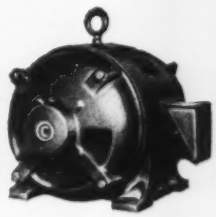
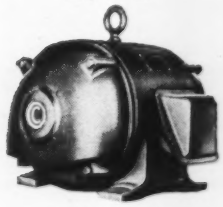


Drip Proof



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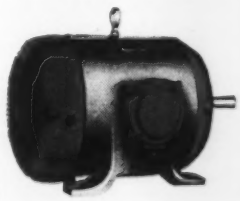

Explosion Proof

Century C MOTORS

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- Wound Rotor Motors—1 to 400 H.P.
- Synchronous Motors—20 to 150 H.P.

SINGLE PHASE
- Split Phase Induction—1/6, 1/4, 1/3 H.P.
- Capacitor—1/6 to 20 H.P.
- Repulsion Start, Brush Lifting, Induction—1/2 to 20 H.P.

DIRECT CURRENT MOTORS
- 1/6 to 300 H.P.

GENERATORS
- AC, .63 to 250 KVA
- DC, .75 to 200 KW

GEAR MOTORS
- 1/8 to 1-1/2 H.P.

MOTOR GENERATOR SETS
- AC to DC, AC to AC
- DC to DC, DC to AC

Open Protected, Splash Proof, Totally Enclosed Fan Cooled, Explosion Proof.

Ball Bearing motors are factory lubricated for several years' normal service. Bearing housing construction permits easy re-lubrication when unusual service demands it.

CE-673

To guard your production against the destructive effects of atmospheric hazards, Century offers four types of protective motor frames.

DRIP PROOF—meets the requirements of most installations. Use it where operating conditions are relatively clean and dry. Top half of the frame is enclosed to keep out falling solids and dripping liquids.

SPLASH PROOF—keeps splashing liquids out of the motor even when the frame is washed with the full force of a hose. Use Century Splash Proof motors indoors or outdoors.

TOTALLY ENCLOSED FAN COOLED—resists the hazards of abnormal concentrations of dusts, powders, grit, oil mists, acid and alkali fumes.

EXPLOSION PROOF—protects life and property in atmospheres charged with explosive dusts or vapors.

The properly selected protection with the wide variation of starting torque characteristics to choose from provides long operating life and improves the production of the driven equipment.

Century motors are available in a wide range of kinds and types—in sizes from 1/6 to 400 horsepower—for single phase, polyphase and direct current applications.

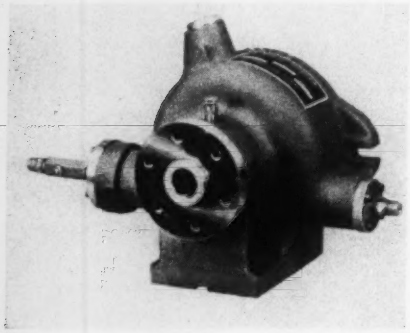
Specify Century motors for all your electric power requirements.

CENTURY ELECTRIC CO. 1806 Pine St. • St. Louis 3, Mo.

Offices and Stock Points in Principal Cities

fords operational economies. It follows a complete cycle of operation without attention from the operator.

Reduced cycle time results in increased production and decreased labor costs. Also eliminated are adjustments and setups between operations. Because accurate spacing is insured by the positive locking mechanism, scrap and rework are considerably reduced.



Check No. 7 on Reply Card for more Details

Tractor Hauls 36 Tons

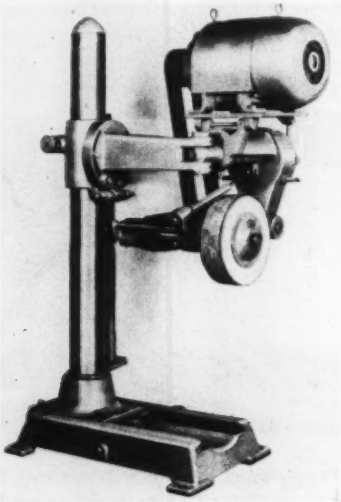
Ability to tow 36 tons of materials on level pavement is incorporated in the design of the model 18 Unitow industrial tractor built by Hensel Green & Co., 9 S. Clinton St., Chicago 6, Ill. It is equipped with pneumatic tires on all four wheels. The turning radius is 72 inches. Three speeds forward of 3.3 to 10 mph with reverse speed of 3.7 mph enable the 1800-pound drawbar pull tractor to function under most operating conditions. Power is furnished by an International Harvester U-1 engine.

Check No. 8 on Reply Card for more Details

Space Saving Buffing Head

A universal polishing or buffing head, manufactured by Murray-Way Corp., Detroit, Mich., uses less floor space, but is versatile. Known as the 60 series, heads are available in two sizes: No. 61 rated at 10 to 15 hp and No. 62 rated at 5 to 7½ hp.

Heads will operate either right or left hand, without extra brackets or extensive mechanical adjustment. Because of their compactness, heads will operate on 3-foot centers, reducing required diameter of dial-tables and permitting economies in length of conveyors and number of fixtures required. Pneumatic controls insure constant and accurate work-pressure automatically.



Check No. 9 on Reply Card for more Details

Lift Truck More Maneuverable

Controls designed into the Load-Mobile electric lift truck made by Market Forge Co., Everett, Mass., enable the operator to select either a low or high operating speed, the former making it more maneuverable in close quarters. Spring-mounted casters increase stability, especially in narrow models. These casters normally clear the floor, but when the truck tilts, the heavy springs right it promptly.

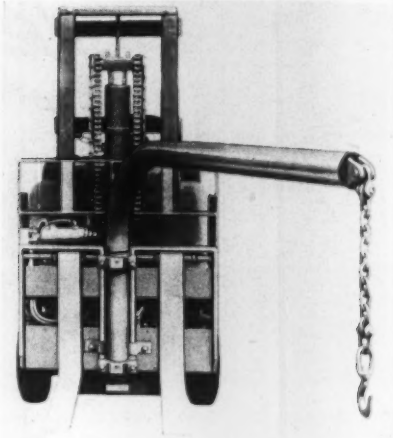
Sealed ball bearings in the control system add ease of operation of the foot pedal. A heavy roller chain operates the brake. Hydraulic lifting mechanism is arranged in a vertical position at the front end of the hood. Truck is available for conventional skid platforms, pallet truck for double-faced pallets, freight and pick-up truck, and as a tractor.

Check No. 10 on Reply Card for more Details

Crane Arm Swings to Side

Pivoted so that a two-way hydraulic cylinder can swing it laterally 20 degrees to either side of center, a crane arm made by Towmotor Corp., Cleveland, O., for attachment to lift trucks, can position loads up to 800 pounds at 80-inch load center. The slewing arm is readily detachable so that the truck can be used with standard pallet forks.

Truck shown is a model LT-44 lift truck, equipped with the arm. Attachment will increase flexibility in loading crated materials in box cars.



Check No. 11 on Reply Card for more Details

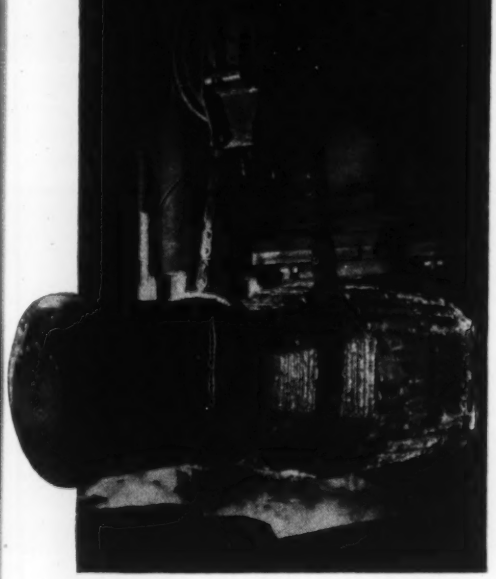
Switchboard Is Pre-Engineered

Designed to centralize power and lighting switching in a one dead-front, freestanding package is a line of custom built, pre-engineered switchboards announced by Trumbull Electric Mfg. Co., Plainville, Conn. Called Centr-A-Power, switchboards consist of a series of vertical rigid steel troughs into which are inserted all types of switching devices. Troughs are connected by continuous power bus which may be fed from the bottom or top of trough.

Individual switchboard units take power from silver-plated, vertical bus bars by means of spring-loaded stabs attached to back of units. Each unit is electrically and mechanically isolated from other units in case of faults or short circuits. The standard 18-inch trough mounts circuit breakers up to 600 amp and fusible

Drop Forgers...

CUT MAINTENANCE COSTS *With* FORGED HAMMER PARTS



Anvil base for 12,000 lb. drop hammer

In the past, intricate shapes and hard-to-forge metals caused a lot of grief in the drop forging industry. But today, drop forgers everywhere have shown their skill at meeting the demands of industry; and materials once considered *very* difficult to forge are turned out with ease.

Just one big problem remains: much of the equipment in use today was never designed to take the punishment of forging stainless steels, high alloys and light metals. Premature failure has, in many cases, sent costs skyrocketing. As a result, many drop forgers have replaced hammer parts with the form of steel they *know* will stand up—**forgings.**

Forged hammer anvil bases and columns are made to order to withstand tremendous impact, and their superior qualities will inevitably reduce downtime and cut operating costs.

Carnegie-Illinois Steel Corporation is a specialist in *heavy* forgings. We make our own steel, forge it, heat-treat it and rough or finish machine it to your requirements. Bases and columns can be furnished for all sizes of board or steam hammers.

Let us quote on your requirements. Deliveries are prompt.

CARNEGIE-ILLINOIS STEEL CORPORATION, PITTSBURGH · COLUMBIA STEEL COMPANY, SAN FRANCISCO
TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM · UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS TRADE MARK

U·S·S HEAVY FORGINGS

0-1868

UNITED STATES STEEL

Performance Records
JUST DON'T HAPPEN

Performance in any product begins with the manufacturer's policy. Here at Federal we are concerned only with producing Federal resistance welders and Warco presses that will deliver satisfactorily year in and year out. All Federal machines are designed for simplicity of operation and maintenance, and ruggedly built for the long haul.

If you now have a Federal Welder or a Warco Press in your plant check your performance records . . . we think this will prove our point. And, if you are not now operating a Federal or a Warco, and are contemplating the purchase of new equipment, listen to the Federal story . . . it will pay you in long-term performance, less down time, higher production and lower maintenance costs. Federal representatives in principal cities.

Automatic cylinder forming seam welder for mass production of cans.

Federal WELDERS®

THE FEDERAL MACHINE & WELDER COMPANY
WARREN, OHIO

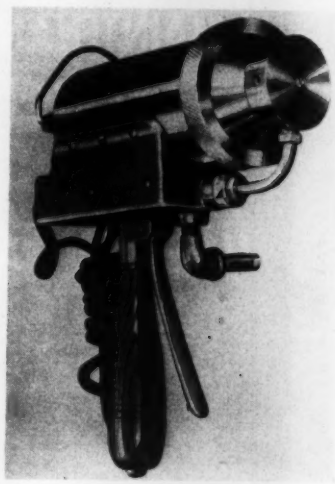
Warco PRESSES®

switches up to 200 amp, 600 v maximum. Two larger sizes of 22 and 28-inch width are available for fusible devices up to a 1200 amp maximum and for circuit breakers up to 1600 amp maximum. All troughs are 90 inches high.

Check No. 12 on Reply Card for more Details

Gun Sprays Low-Melting Metal

Designed for the spraying of low melting alloys and metals is a spray gun announced by Foundry Accessories Division, Cooper Alloy Foundry Co., Hillside, N. J. The Spray King incorporates adjustable spray, non-



clog, nondrip nozzle and thermostatic control. It weighs less than 5 pounds and has a capacity of 7 pounds of low melting alloy. It is suitable for intermittent or production spraying.

Check No. 13 on Reply Card for more Details

Steel Mill Straddle Carrier

Ross Carrier Co., 710 Miller St., Benton Harbor, Mich., is offering its series 100 straddle carrier for handling 45,000-pound loads and traveling up to 33 mph forward or reverse. De-

signed for steel mills and industries having similar severe service conditions, the carrier has good road and load visibility and conforms with highway safety requirements.

Frame is heavily reinforced and

Quality control...

another feature of Accurate service

A portion of the elaborate quality control equipment in use at Accurate.

. . . and it lowers

the overall cost of your springs

THE uniformly high quality of Accurate springs . . . their rigid adherence to the customers specifications . . . are the natural result of the combination of skilled springmakers and the most modern springmaking machines *plus* painstaking quality control procedures. Quality control is just one of the features of Accurate service. Certainly, we could "get by" without it like so many other spring manufacturers do. But we have found it pays off handsomely for our customers *and* ourselves. The customer gets uniformly good springs with savings in time and money because there are fewer rejects and assembly runs more smoothly. We come out ahead because our customers are pleased and we're not subjected to a flood of substandard "returns." In the overall, it means lower costs for everyone.

The best way to find out what we mean is to give us a trial. For a quotation just send a drawing and specifications or, if you prefer, Accurate engineers will be pleased to give their assistance in developing new or improved design. ACCURATE SPRING MFG. CO., 3823 W. Lake St., Chicago 24, Illinois.

Write for your copy of the new revised Accurate Handbook of Technical Data on Springs. This booklet has been out of print for some time and if you have previously requested a copy and have not received it, we would appreciate your asking again.

Be sure the springs you buy are Accurate

Accurate Springs

Springs
Wire Forms
Stampings

is electrically welded into a rugged unit. Power is furnished by heavy duty 6-cylinder 140 hp gasoline engine. Both steering and brakes are of the four-wheel hydraulic type. Hoisting mechanism also is hydraulic.

Check No. 14 on Reply Card for more Details

Cools to —120° F

Designed for heavy duty operation at —120° F, a temperature established as necessary for complete stabilization of metals, heat treatment of steels and shrink fit purposes, is an industrial chilling unit developed by Sub-Zero Products Division, Deepfreeze Distributing Corp., 3928 Reading Rd., Cincinnati 9, O. The model R-120 unit is insulated with Santocel, has a 10 cu ft chilling chamber and is refrigerated by two units in cascade relationship.

Thermal capacity is 2000 Btu per hour at the —120° F temperature. Outside dimensions of the unit are 39 x 42 x 90 inches. Chilling chamber is 18 x 30 x 33 inches. Its ¾ and 1 hp motors are for 220 v, 3-phase, 60-cycle operation. Temperature is adjustable from 0° to the minimum.

Check No. 15 on Reply Card for more Details

• • •

BATTERY CHARGER: Unitized multiple circuit battery charging of driver-ride electric trucks with a new charger consisting of a motor generator and a generator control panel and one or more battery charging panels, is announced by Hertner Electric Co., Cleveland 11, O. Chargers are available in units of 2, 3, 4 or more circuits.

Check No. 16 on Reply Card for more Details

LOCK NUT: The improved design of Gripco lock nut, available from Grip Nut Co., Chicago, Ill., has six double-triangle thread deflection areas instead of three, thereby producing a longer lasting grip to withstand severe vibration. They are furnished in sizes No. 6 through 1½-inches light, standard semifinished nut dimensions.

Check No. 17 on Reply Card for more Details

HYDRAULIC MOTOR VALVE: Designed for automatic operation by thermostats, pressurstats, liquid level or flow controls, a new electro-hydraulic motor valve for open and shut control is announced by Sarco Co. Inc., New York 1, N. Y. It is two-wire normally closed and for direct connection to 110 v ac, 60 cycle current.

Check No. 18 on Reply Card for more Details

CONTROL STATIONS: Class 15-022, type OT pushbuttons, designed for machine tool control and other heavy duty installations are available in the 12-unit Oil-Tite control stations made by Westinghouse Electric Corp., Pittsburgh 30, Pa. A durable, resilient cork-neoprene gasket provides dependable seal against oil, coolant, cutting compound and water. Five types of operator heads with matching pilot lights provide for unit flexibility.

Check No. 19 on Reply Card for more Details

PREPARES SPECIMENS: Claud S. Gordon Co., Chicago 16, Ill., introduces the Gordon-Campbell transverse test core maker for use in preparing standard test specimens for the investigation of core materials and core baking practice. Test specimens are 1 x 1 x 8 inches. Uniform ramming is obtained by jolting sand mixture into a core box from a hopper having height of 3 inches.

Check No. 20 on Reply Card for more Details

SNAP-ACTION SWITCH: Model M-OM snap action switch, made by Acro Mfg Co., Columbus 16, O., is an open blade switch utilizing the company's rolling spring principle. It has particular application for condensed timing and sequence operations. Current carrying capacity is 3 amp, at 125 v, ac.

Check No. 21 on Reply Card for more Details

MULTI-CHARACTER HANDSTAMPS: Standard handstamps are obtainable from Quality Die Co., Chicago 17, Ill., with popular descriptive words, steel trade names, codes, serial numbers, fractions, etc. They come with 3/32-inch high characters, are 3½ inches long and are made up to a maximum of 10 characters per stamp, reading in one line.

Check No. 22 on Reply Card for more Details

GEAR-MOTOR: BO type gear motor, developed by Janette Mfg. Co., Chicago, Ill., for application to combustion control systems, uses double reduction worm gearing to furnish an output speed of 0.4006 rpm and approximately 220 pound inches output torque. Speed reduction ratio is 42.42.4 to 1.

Check No. 23 on Reply Card for more Details

ASSURES STEADY FLOW: Series 81 pneumatic vibrators for intermittent or continuous operation on all types and sizes of storage bins, hoppers and chutes handling powdered or granular materials are available from Spo Inc., Cleveland 5, O. They deliver powerful, hammer-like impacts in a direction 90 degrees to material flow and prevent contents of bins from arching over or plugging.

Check No. 24 on Reply Card for more Details

TUBE FLARING TOOL: Model 410 combination tube flaring tool, offered by Parker Appliance Co., Cleveland 12, O., combines a flaring pin in a vise slide on a split die block having a series of holes to accommodate ¼, 5/16, 3/8, 1/2 and 5/8-inch tubing. Vise handle is a sliding type.

Check No. 25 on Reply Card for more Details

DRAWER DIVIDER: Equipto, Division of Aurora Equipment Co., Aurora, Ill., offers a tilt divider for parts bins and drawers. Slanted back tops make dividers easy to take out. A new type visibility label holder is on each one.

Check No. 26 on Reply Card for more Details

LIFTING MAGNET: An improved lifting magnet, announced by Dings Magnetic Separator Co., Milwaukee, Wis., can be used on overhead or crawler cranes to hoist, load, transport or otherwise handle all types of magnetic materials. It is available in five sizes: 29, 39, 45, 55 and 65 inches diameter.

Check No. 27 on Reply Card for more Details

NESTING PALLETS: Nesteel all-steel pallets, introduced by Powell Pressed Steel Co., Hubbard, O., are designed so that they will nest one into another, thereby conserving space. They allow four way fork lift entry and have adequate perforations for banding or tieing load to pallet.

Check No. 28 on Reply Card for more Details

FOR FIRE DETECTION: Ma-Et, a new electric trip fire alarm box which may be automatically actuated by operation of rate-of-rise or fixed-temperature thermostats, or manually tripped by breaking the glass, is offered by Autocall Co., Shelby, O. When tripped, four complete rounds of coded alarm are transmitted through audible signals of the fire alarm system, enabling personnel to locate the fire.

Check No. 29 on Reply Card for more Details

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Market Summary

STEEL is pouring from the nation's furnaces in record volume. National ingot operations rose ½ point last week to 102 per cent of capacity, equivalent to production of 1,967,300 net tons, an alltime record. For the first nine months this year, output totaled 71,608,358 tons, high for any like period and only 8 per cent under the total for all of 1949. October production is expected to break the monthly record of 8,551,887 tons established in May this year. It likely will be the seventh successive month in which output exceeded 8 million tons.

SUPPLY— Bulk of steel production continues channeled into civilian goods manufacturing lines but emergency needs are taking a steadily rising percentage of total output. Military and related requirements are now beginning to reach placement stage in volume. However, due to the 45-day lead time required on DO orders, new military business cannot be handled before first quarter next year. Some military business placed last week will go into December rolling schedules and military orders placed a while back and subsequently certified with DO ratings will be handled before the current quarter closes.

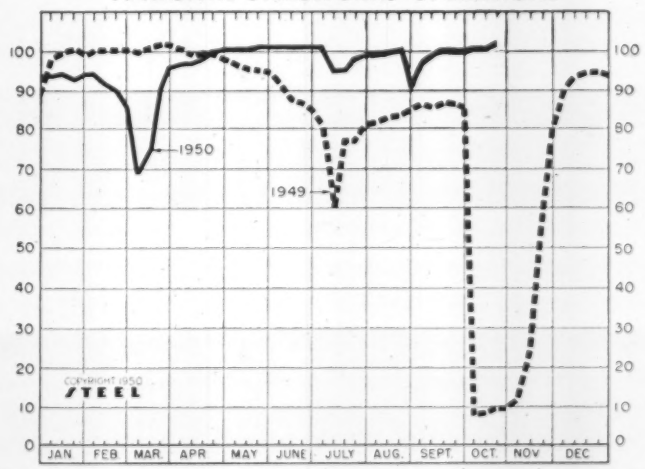
DEMAND— Broadly, the only business now being accepted by the mills is rated tonnage. Except in a few lines, the steelmakers have not opened books for first quarter on regular commercial business. And they are sold out for the remainder of this year. As a result, with emergency rated tonnage taking increasing rolling time, substantial order carryovers into first quarter of 1951 are indicated in all products. Civilian consumers are scrambling for tonnage to sustain operations. The gray and conversion markets are providing some respite in the shortage but tonnage from these directions falls far short of filling requirements.

ALLOCATIONS— In addition to military needs, the steel mills are committing themselves on car construction and maintenance requirements under the recently revised voluntary allocations plan. Car steel allocations call for an average of 325,000 tons per month for first quarter. Other similar allocation plans are under consideration providing preferences for certain requirements regarded as important to the defense program. These plans may include ratings for warehouses so that the latter will be assured reasonably substantial tonnage to care for pressing needs of smaller manufacturers depending on distributors as their supply source. Whether there will be too many of these voluntary allocation plans in operation as time passes to prevent effective distribution, remains to be seen. Should allocations pile up on allocations resulting in production complications it is believed certain some form of the Controlled Materials Plan, so effective during the war, will be instituted before distribution breaks down.

PRICES— Rising production costs are forcing upward adjustments in price schedules of the smaller producing interests. Generally, however, the larger interests are marking time on prices pending settlement of the wage question. Last week a number of makers effected increases on strip items, wire products and pig iron.

COMPOSITES— Increases on pig iron and various finished steel products last week are reflected in advances in STEEL's price composites. The weighted index on finished steel rose to 157.62 from 157.29, while the arithmetical composite advanced to $95.09 from $94.64. Pig iron composites rose with No. 2 foundry, $49.35 against $48.97 the week preceding, basic, $48.10 against $47.72, and malleable, $49.62 against $49.20. Signs are appearing of a weakening in the formula price on steelmaking grades of scrap, being reflected in an advance of the composite on this grade to $41.50, up 50 cents from the level that had prevailed for three preceding weeks.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended Oct. 21	Change	Same Week 1949	Same Week 1948
Pittsburgh	103	0	3.5	97
Chicago	102.5	— 0.5*	5.5	98.5
Eastern Pa.	99	0	8.5	95
Youngstown	106	0	0	104
Wheeling	97	— 1	61	91
Cleveland	100	+ 4*	0	99
Buffalo	104	0	0	104
Birmingham	100	0	6	100
New England	89	+ 7	55	87
Cincinnati	106	+ 3	52	103
St. Louis	95	+ 1	84.5	89.5
Detroit	106	+ 2*	37	98
Western	100	— 3	21	
Estimated national rate	102	+ 0.5	9.5	98.5

Based on weekly steelmaking capacity of 1,906,267 net tons for first half and 1,926,803 second half, 1950; 1,843,516 net tons for 1949; 1,802,476 net tons for 1948. *Change from revised rate.

News Summary—p. 35 Production-Engineering News—p. 65

Composite Market Averages

	Oct. 19 1950	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
FINISHED STEEL INDEX, Weighted:					
Index (1935-39 av.=100).	157.62	157.29	156.99	152.52	101.87
Index in cents per lb. ..	4.270	4.261	4.253	4.132	2.760
ARITHMETICAL PRICE COMPOSITES:					
Finished Steel, NT	$95.09	$94.64	$94.50	$91.64	$58.27
No. 2 Fdry, Pig Iron, GT	49.35	48.97	47.71	46.10	24.67
Basic Pig Iron, GT	48.10	47.72	46.66	45.60	24.00
Malleable Pig Iron, GT..	49.63	49.20	48.41	47.27	25.29
Steelmaking Scrap, GT..	41.50	41.00	40.58	26.17	19.17

• Revised.

Weighted finished steel index based on average shipments and Pittsburgh district prices of the following 14 representative products during 5-year base period 1935-39. Structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-rolled strip. For complete explanation see STEEL, Sept. 19, 1949, p. 54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold-finished bars, galvanized sheets and hot-rolled strip.

Basic and No. 2 foundry pig iron composites are based on average prices at Pittsburgh, Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown. Malleable composite based on same points, except Birmingham.

Steelmaking scrap composite based on average prices of No. 1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS

	Oct. 19 1950	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh....	3.45	3.45	3.45	3.35	2.25
Bars, H.R., Chicago	3.45	3.45	3.45	3.35	2.25
Bars, H.R., del. Philadelphia	3.93	3.93	3.93	3.83	2.57
Bars, C.F., Pittsburgh	4.15	4.15	4.10–15	3.95–4.00	2.75
Shapes, Std., Pittsburgh ..	3.40	3.40	3.40	3.25	2.10
Shapes, Std., Chicago	3.40	3.40	3.40	3.25	2.10
Shapes, del. Philadelphia..	3.46	3.46	3.46	3.50	2.215
Plates, Pittsburgh	3.50	3.50	3.50	3.40	2.25
Plates, Chicago	3.50	3.50	3.50	3.40	2.25
Plates, Coatesville, Pa. ...	3.90	3.90	3.90	3.50	2.25
Plates, Sparrows Point, Md.	3.50	3.50	3.50	3.40	2.25
Plates, Claymont, Del. ...	3.90	3.90	3.90	3.50	2.25
Plates, del. Philadelphia ..	3.84	3.84	3.84	3.59	2.30
Sheets, H.R., Pittsburgh..	3.35	3.35	3.35	3.25	2.20
Sheets, H.R., Chicago	3.35	3.35	3.35	3.25	2.20
Sheets, C.R., Pittsburgh ..	4.10	4.10	4.10	4.00	3.05
Sheets, C.R., Chicago	4.10	4.10	4.10	4.00	3.05
Sheets, C.R., Detroit	4.30	4.30	4.30	4.20	3.15
Sheets, Galv., Pittsburgh..	4.40	4.40	4.40	4.40	3.70
Strip, H.R., Pittsburgh ...	3.50–75	3.50	3.50	3.25	2.10
Strip, H.R., Chicago	3.25	3.25	3.25	3.25	2.10
Strip, C.R., Pittsburgh	4.15–50	4.15–50	4.15–50	4.00	2.80
Strip, C.R., Chicago	4.30	4.30	4.30	4.00–15	2.90
Strip, C.R., Detroit	4.35–95	4.35–95	4.35–95	4.20–25	2.90
Wire, Basic, Pittsburgh ...	4.50–75	4.50–75	4.50	4.15	2.75
Nails, Wire, Pittsburgh ...	5.30–60	5.30–60	5.30	5.15	2.90
Tin plate, box, Pittsburgh.	$7.50	$7.50	$7.50	$7.75	$5.00

SEMIFINISHED

Billets, forging, Pitts. (NT)	$63.00	$63.00	$63.00	$61.00	$42.00
Wire rods, 5/16-⅜", Pitts...	3.85	3.85	3.85	3.40	2.15

PIG IRON, Gross Ton

Bessemer, Pitts.	$47–$50	$47–$50	$47–$50	$47.00	$25.50
Basic, Valley	46–49	46–49	46–49	46.00	24.50
Basic, del. Phila.	51.44	53.39	50.39	49.44	26.34
No. 2 Fdry, Pitts.	49.50	49.50	49.50	46.50	25.00
No. 2 Fdry, Chicago	49.50	49.50	46.50	46.50	25.00
No. 2 Fdry, Valley	49.50	49.50	49.50	46.50	25.00
No. 2 Fdry, del. Phila. ...	51.94	50.89	50.89	49.94	26.84
No. 2 Fdry, Birm.	45.88	45.88	42.38	39.38	21.38
No. 2 Fdry (Birm.) del. Cin.	52.58	52.58	49.08	46.08	25.06
Malleable, Valley	49.50	49.50	49.50	46.50	25.00
Malleable, Chicago	46.50-49.50	46.50-49.50	46.50	46.50	25.00
Charcoal, Lyles, Tenn. ...	62.00	62.00	60.00	60.00	33.00
Ferromanganese, Etna, Pa.	175.00	175.00	175.00	175.00	140.33•

• Delivered, Pittsburgh.

SCRAP, Gross Ton

No. 1 Heavy Melt. Pitts...	$44.00	$44.00	$44.00	$29.00	$20.00
No. 1 Heavy Melt. E. Pa..	40.50	39.00	37.75	24.00	18.75
No. 1 Heavy Melt. Chicago	40.00	40.00	40.00	25.50	18.75
No. 1 Heavy Melt. Valley..	43.75	43.75	43.75	31.25	20.00
No. 1 Heavy Melt. Cleve...	43.25	43.25	43.00	26.50	19.50
No. 1 Heavy Melt. Buffalo.	41.50	41.50	41.50	27.25	19.25
Rails, Rerolling, Chicago..	64.50	64.50	59.50	41.50	22.25
No. 1 Cast, Chicago.....	53.50	53.50	50.50	41.50	20.00

Coke, Net Ton

Beehive, Furn., Connlsvl...	$14.25	$14.25	$14.25	$13.25	$7.50
Beehive, Fdry., Connlsvl...	16.50	16.50	16.00	15.75	8.25
Oven Fdry., Chicago	21.00	21.00	21.00	20.00	13.00

NONFERROUS METALS

Copper, del. Conn.	24.50	24.50	22.50-24.50	17.625	12.00
Zinc, E. St. Louis	17.50	17.50	17.50	9.25	8.25
Lead, St. Louis	15.80	15.80	15.80	12.80	6.35
Tin, New York	113.00	112.00	102.50	95.75	52.00
Aluminum, del.	19.00	19.00	17.50	17.00	15.00
Antimony, Laredo, Tex. ..	32.00	32.00	32.00	32.00	14.50
Nickel, refinery, duty paid.	48.00	48.00	48.00	40.00	35.00

Pig Iron

For key to producing companies, turn next page.
Minimum delivered prices do not include 3% federal tax.

PIG IRON, Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa. B2	$51.00	$51.50	$52.00	$52.50
Brooklyn, N.Y., del.	....	55.79	56.29	....
Newark, del.	53.63	54.13	54.63	55.13
Birmingham District				
Alabama City, Ala. R2	45.38	45.88	....	....
Birmingham R2	45.38	45.88	....	....
Birmingham S9	45.38	45.88	....	....
Woodward, Ala. W15	45.38	45.88	....	....
Cincinnati, del.	....	52.58	....	....
Buffalo District				
Buffalo H1, R2	49.00	49.50	50.00	....
Tonawanda, N.Y., W12	49.00	49.50	50.00	....
N. Tonawanda, N.Y., T9	....	49.50	50.00	....
Boston, del.	58.26	58.76	59.20	....
Rochester, N.Y., del.	51.63	52.13	52.63	....
Syracuse, N.Y., del.	52.58	53.08	53.58	....
Chicago District				
Chicago I-3	49.00	49.50	49.50	50.00
Gary, Ind. C3	46.00	....	46.50	....
Indiana Harbor, Ind. I-2	49.00	....	49.50	....
So. Chicago, Ill. W14	49.00	49.50	49.50	....
So. Chicago, Ill. Y1	49.00	49.50	49.50	....
So. Chicago, Ill. C3	46.00	....	46.50	47.00
Milwaukee, del.	47.89	51.39	48.39	48.89
Muskegon, Mich., del.	....	54.98	51.98	....
Cleveland District				
Cleveland A7	46.00	46.50	46.50	47.00
Cleveland R2	49.00	49.50	49.50	....
Akron, del. from Cleve.	48.39	48.89	48.89	49.39
Lorain, O. N3	46.00	....	....	47.00
Duluth I-3	....	....	49.50	....
Erie, Pa. I-3	49.00	49.50	49.50	50.00
Everett, Mass. E1	....	52.25	52.75	....
Fontana, Calif. K1	52.00	52.50	....	....
Geneva, Utah G1	46.00	46.50	....	....
Seattle, Tacoma, Wash., del.	....	54.20	....	....
Portland, Oreg., del.	....	54.20	....	....
Los Angeles, San Francisco, del. ..	53.70	54.20	....	....
Granite City, Ill. M10	50.90	51.40	51.90	....
St. Louis, del. (inc. tax)	51.65	52.15	52.65	....
Ironton, Utah C11	46.00	46.50	....	....
Lone Star, Tex. L6	45.00	•45.50	45.50	....
Minnequa, Colo. C10	49.00	49.50	50.00	....
Pittsburgh District				
Neville Island, Pa. P6	....	49.50	49.50	50.00
Pitts., N.&S. sides, Ambridge, Aliquippa, del.	....	50.69	50.69	51.19
McKees Rocks, del.	....	50.45	50.45	50.95
Lawrenceville, Homestead, McKeesport, Monaca, del.	....	50.94	50.94	51.44
Verona, del.	....	51.40	51.40	51.90
Brackenridge, del.	....	51.63	51.63	52.13
Bessemer, Pa. C3	46.00	....	46.50	47.00
Clairton, Rankin, So. Duquesne, Pa. C3	46.00	....	....	....
McKeesport, Pa. N3	46.00	....	....	47.00
Sharpsville, Pa. S6	....	....	49.50	50.00
Steelton, Pa. B2	48.00	48.50	49.00	49.50
Steubenville, O. W10	46.00	....	....	....
Swedeland, Pa. A3	50.00	50.50	51.00	51.50
Philadelphia, Pa.	*51.44*	*51.94*	*52.44*	*52.94*
Toledo, O. I-3	49.00	49.50	49.50	50.00
Cincinnati, del.	54.01	54.51	....	....
Troy, N.Y., R2	51.00	51.50	52.00	52.50
Youngstown District				
Hubbard, O. Y1	49.00	49.50	49.50	....
Youngstown C3	46.00	....	....	47.00
Youngstown Y1	49.00	49.50	49.50	50.00
Mansfield, O., del.	50.26	53.76	53.76	51.26

• Low phos, southern grade.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si over base grade, 1.75-2.25%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1%, or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SIVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1.50 for each 0.5% Si)

Jackson, O. G2, J1	$57.00
Buffalo H1	58.25

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 for 0.045% max. P)

Niagara Falls, N.Y. P15	$78.00
Keokuk, Iowa, Openhearth & Fdry, frt. allowed K2	82.00
Keokuk, Iowa, OH & Fdry., 12½ lb. piglets, frt. allowed K2...	86.00
Wenatchee, Wash., OH & Fdry., frt. allowed K2	82.00

CHARCOAL PIG IRON, Gross Ton

(Low phos. semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles, Tenn. T3	$62.00

LOW PHOSPHOROUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$51.00
Steelton, Pa. B2	57.00
Philadelphia delivered	57.00
Troy, N.Y. R2	57.00

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Semifinished and Finished Steel Products

Mill prices as reported to STEEL, Oct. 19, 1950; cents per pound except as otherwise noted. Changes shown in italics. Code numbers following mill points indicate producing company; key on next two pages.

INGOTS, Carbon, Forging (NT)
Detroit R7 ..... $50.00
Fontana,Calif. K1 .... 76.00
Munhall,Pa. C3 ..... 50.00

INGOTS, Alloy (NT)
Detroit R7 ..... $51.00
Fontana,Calif. K1 .... 77.00
Houston,Tex. S5 ..... 59.00
Midland,Pa. C18 ..... 51.00
Munhall,Pa. C3 ..... 51.00
So.Duquesne,Pa. C3 .. 51.00

BILLETS, BLOOMS & Slabs Carbon, Rerolling (NT)
Bessemer,Pa. C3 .... $53.00
Clairton,Pa. C3 ..... 53.00
Conshohocken,Pa. A3 .. 62.00
Ensley,Ala. T2 ..... 53.00
Fairfield,Ala. T2 ..... 53.00
Fontana,Calif. K1 .... 72.00
Gary,Ind. C3 ..... 53.00
Johnstown,Pa. B2 .... 53.00
Lackawanna,N.Y. B2.. 53.00
Munhall,Pa. C3 ..... 53.00
So.Chicago,Ill. C3 .... 53.00
So.Duquesne,Pa. C3 .. 53.00

Carbon, Forging (NT)
Bessemer,Pa. C3 ..... $63.00
Buffalo R2 ..... 63.00
Canton,O. R2 ..... 63.00
Clairton,Pa. C3 ..... 63.00
Cleveland R2 ..... 63.00
Conshohocken,Pa. A3.. 68.00
Detroit R7 ..... 66.00
Ensley,Ala. T2 ..... 63.00
Fairfield,Ala. T2 ..... 63.00
Fontana,Calif. K1 ... 82.00
Gary,Ind. C3 ..... 63.00
Geneva,Utah G1 ..... 63.00
Houston,Tex. S5 ..... 71.00
Ind.Harbor,Ind. I-2 ... 63.00
Johnstown,Pa. B2 .... 63.00
Lackawanna,N.Y. B2... 63.00
LosAngeles B3 ..... 82.00
Munhall,Pa. C3 ..... 63.00
Seattle B3 ..... 82.00
So.Chicago C3,R2,W14 . 63.00
So.Duquesne,Pa. C3 .. 63.00
So.SanFrancisco B3 ... 82.00

Alloy (NT)
Bethlehem,Pa. B2 .... $66.00
Buffalo R2 ..... 66.00
Canton,O. R2, T7 .... 66.00
Conshohocken,Pa. A3.. 70.00
Detroit R7 ..... 66.00
Fontana,Calif. K1 .... 85.00
Gary,Ind. C3 ..... 66.00
Houston,Tex. S5 ..... 74.00
Ind.Harbor,Ind. Y1 .... 66.00
Johnstown,Pa. B2 .... 66.00
Lackawanna,N.Y. B2.. 66.00
LosAngeles B3 ..... 86.00
Massillon,O. R2 ..... 66.00
Midland,Pa. C18 ..... 66.00
Munhall,Pa. C3 ..... 66.00
So.Chicago C3,R2,W14 . 66.00
So.Duquesne,Pa. C3 .. 66.00
Warren,O. C17 ..... 66.00
Youngstown Y1 ..... 66.00

ROUNDS, SEAMLESS TUBE (NT)
Canton,O. R2 ..... $76.00
Cleveland R2 ..... 76.00
Fontana,Calif. K1 .... 100.00
Gary,Ind. C3 ..... 76.00
Ind.Harbor,Ind. I-2 .... 76.00
Massillon,O. R2 ..... 76.00
So.Chicago,Ill. R2 .... 76.00
So.Duquesne,Pa. C3 ... 76.00

SHEETS BARS (NT)
Fontana,Calif. K1 .... $86.00

SKELP
Aliquippa,Pa. J5 ..... 3.25
Munhall,Pa. C3 ..... 3.15
Warren,O. R2 ..... 3.15
Youngstown C3, R2 .... 3.15

WIRE RODS
AlabamaCity,Ala. R2 .. 3.85
Buffalo W12 ..... 3.85
Cleveland A7 ..... 3.85
Donora,Pa. A7 ..... 3.85
Fairfield,Ala. T2 ..... 3.85
Fontana,Calif. K1 .... 4.60
Houston,Tex. S5 ..... 4.25
Ind.Harbor,Ind. Y1 .... 3.85
Johnstown,Pa. B2 .... 3.85
Joliet,Ill. A7 ..... 3.85
LosAngeles B3 ..... 4.65
Minnequa,Colo. C10 .... 4.10
Monessen,Pa. P7 ..... 4.05
No.Tonawanda,N.Y. B11. 3.85
Pittsburg,Calif. C11 .. 4.50
Portsmouth,O. P12 .... 3.85
Roebling,N.J. R5 ..... 3.95
So.Chicago,Ill. R2 ..... 3.85
SparrowsPoint,Md. B2.. 3.95
Sterling,Ill.(1) N15 .... 4.10
Struthers,O. Y1 ..... 3.85
Torrance,Calif. C11 ... 4.65
Worcester A7 ..... 4.15

STRUCTURALS
Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 .. 3.40
Aliquippa,Pa. J5 ..... 3.40
Bessemer,Ala. T2 ..... 3.40
Bethlehem,Pa. B2 ..... 3.45
Clairton,Pa. C3 ..... 3.40
Fairfield,Ala. T2 ..... 3.40
Fontana,Calif. K1 .... 4.00
Gary,Ind. C3 ..... 3.40
Geneva,Utah G1 ..... 3.40
Houston,Tex. S5 ..... 3.80
Ind.Harbor,Ind. I-2 .... 3.40
Johnstown,Pa. B2 ..... 3.45
KansasCity,Mo. S5 .... 4.00
Lackawanna,N.Y. B2 .. 3.45
LosAngeles B3 ..... 4.00
Minnequa,Colo. C10 .... 3.85
Munhall,Pa. C3 ..... 3.40
Niles,Calif.(22) P1 .... 4.02
Phoenixville,Pa. P4 .... 4.25
Portland,Oreg. O4 .... 4.05
Seattle B3 ..... 4.05
So.Chicago,Ill. C3, W14. 3.40
So.SanFrancisco B3 .... 3.95
Torrance,Calif. C11 .... 4.00
Weirton,W.Va. W6 .... 3.40
Alloy Stand. Shapes
Clairton,Pa. C3 ..... 4.05
Fontana,Calif. K1 .... 5.25
Munhall,Pa. C3 ..... 4.05
So.Chicago,Ill. C3 .... 4.05
H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 ..... 5.15
Bessemer,Ala. T2 ..... 5.15
Bethlehem,Pa.(14) B2... 5.20
Clairton,Pa. C3 ..... 5.15
Fairfield,Ala. T2 ..... 5.15
Fontana,Calif. K1 .... 5.75
Gary,Ind. C3 ..... 5.15
Geneva,Utah G1 ..... 5.10
IndianaHarbor,Ind. Y1 . 5.40
IndianaHarbor,Ind. Y1 . 5.40
Johnstown,Pa. B2 .... 5.20
Lackawanna,N.Y.(14)B2 5.20
LosAngeles B3 ..... 5.75
Munhall,Pa. C3 ..... 5.15
So.Chicago,Ill. C3 ..... 5.15
So.SanFrancisco B3 .... 5.70
Struthers,O. Y1 ..... 5.40
Wide Flange
Bethlehem,Pa. B2 ..... 3.45
Lackawanna,N.Y. B2 .. 3.45
Munhall,Pa. C3 ..... 3.40
So.Chicago,Ill. C3 .... 3.40
H.S., L.A. Wide Flange
Bethlehem,Pa. B2 ..... 5.20
Lackawanna,N.Y. B2 .. 5.20
Munhall,Pa. C3 ..... 5.10
So.Chicago,Ill. C3 ..... 5.10

SHEET STEEL PILING
Ind.Harbor,Ind. I-2 .... 4.20
Lackawanna,N.Y. B2 .. 4.20
Munhall,Pa. C3 ..... 4.20
So.Chicago,Ill. C3 .... 4.20
Weirton,W.Va. W6 .... 4.20

BEARING PILES
Munhall,Pa. C3 ..... 3.40
So.Chicago,Ill. C3 ..... 3.40

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 ..... 5.35
Bessemer,Ala. T2 .... 5.35
Clairton,Pa. C3 ..... 5.35
Cleveland J5, R2 .... 5.35
Conshohocken,Pa. A3 .. 5.35
Ecorse,Mich. G5 ..... 5.85
Fairfield,Ala. T2 ..... 5.35
Fontana,Calif. K1 .... 5.95
Gary,Ind. C3 ..... 5.35
Geneva,Utah G1 ..... 5.35
Ind.Harbor,Ind. I-2 .... 5.35
IndianaHarbor,Ind. Y1 . 5.60
Johnstown,Pa. B2 ..... 5.35
Munhall,Pa. C3 ..... 5.35
Pittsburgh J5 ..... 5.35
Sharon,Pa. S3 ..... 5.70
So.Chicago,Ill. C3 .... 5.35
SparrowsPoint,Md. B2.. 5.35
Warren,O. R2 ..... 5.35
Youngstown Y1 ..... 5.60

PLATES, Open-Hearth Alloy
Claymont,Del. W16 .... 4.50
Coatesville,Pa. L7 .... 4.80
Conshohocken,Pa. A3 .. 4.55
Fontana,Calif. K1 .... 5.40
Gary,Ind. C3 ..... 4.40
Johnstown,Pa. B2 .... 4.40
Munhall,Pa. C3 ..... 4.40
Sharon,Pa. S3 ..... 4.75
So.Chicago,Ill. C3 .... 4.40
SparrowsPoint,Md. B2 .. 4.40

FLOOR PLATES
Cleveland J5 ..... 4.55
Conshohocken,Pa. A3 .. 4.55
Harrisburg,Pa. C5 .... 5.25
Ind.Harbor,Ind. I-2 .... 4.55
Munhall,Pa. C3 ..... 4.55
So.Chicago,Ill. C3 .... 4.55

PLATES (Universal Mill)
Fontana,Calif. K1 .... 4.40

PLATES, Carbon A.R.
Fontana Calif. K1 .... 5.25

PLATES, Carbon Steel
AlabamaCity,Ala. R2 .. 3.50
Aliquippa,Pa. J5 ..... 3.50
Ashland,Ky.(15) A10 .. 3.50
Bessemer,Ala. T2 .... 3.50
Clairton,Pa. C3 ..... 3.50
Claymont,Del. W16 .... 3.90
Cleveland J5 R2 ..... 3.50
Coatesville,Pa. L7 .... 3.90
Conshohocken,Pa. A3 .. 3.75
Ecorse,Mich. G5 ..... 3.75
Fairfield,Ala. T2 ..... 3.50
Fontana,Calif. K1 .... 4.10
Gary,Ind. C3 ..... 3.50
GraniteCity,Ill. G4 .... 4.20
Geneva,Utah G1 ..... 3.50
Harrisburg,Pa. C5 .... 4.25
Houston,Tex. S5 ..... 3.90
Ind.Harbor,Ind. I-2, Y1.. 3.50
Johnstown,Pa. B2 .... 3.50
Lackawanna,N.Y. B2 .. 3.50
Minnequa,Colo. C10 .... 4.30
Munhall,Pa. C3 ..... 3.50
Pittsburgh J5 ..... 3.50
Seattle B3 ..... 4.40
Sharon,Pa. S3 ..... 3.75
So.Chicago,Ill. C3, W14. 3.50
SparrowsPoint,Md. B2 .. 3.50
Steubenville,O. W10 .... 3.50
Warren,O. R2 ..... 3.50
Weirton,W.Va. W6 .... 3.50
Youngstown C3, R2, Y1. 3.50

PLATES, Wrought Iron
Economy,Pa. B14 .... 7.85

PLATES, Ingot Iron
Ashland,c.l.(15) A10 ... 3.75
Ashland,lcl(15) A10 ... 4.25
Cleveland,cl R2 ..... 4.10
Warren,O.cl R2 ..... 4.10

BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 .. 3.45
Aliquippa,Pa. J5 ..... 3.45
Alton,Ill(1) L1 ..... 3.45
Atlanta,Ga. A11 ..... 3.60
Bessemer,Ala. T2 ..... 3.45
Buffalo R2 ..... 3.45
Canton,O. R2 ..... 3.45
Clairton,Pa. C3 ..... 3.45
Cleveland R2 ..... 3.45
Ecorse,Mich. G5 ..... 3.65
Emeryville,Calif. J7 .... 4.20
Fairfield,Ala. T2 ..... 3.45
Fontana,Calif. K1 .... 4.10
Gary,Ind. C3 ..... 3.45
Houston,Tex. S5 ..... 3.85
Ind.Harbor,Ind. I-2, Y1.3.45
Johnstown,Pa. B2 ..... 3.45
KansasCity,Mo. S5 .... 4.05
Lackawanna,N.Y. B2 .. 3.45
LosAngeles B3 ..... 4.15
Milton,Pa. B6 ..... 3.70
Minnequa,Colo. C10 .... 3.90
Niles,Calif. P1 ..... 4.17
N.Tonawanda,N.Y. B11.3.45
Pittsburg,Calif. C11 .... 4.15
Pittsburgh J5 ..... 3.45
Portland,Oreg. O4 .... 4.20
Seattle B3, N14 ..... 4.20
So.Chicago C3, R2, W14.3.45
So.Duquesne,Pa. C3 .... 3.45
S.SanFran.,Cal. B3 .... 4.20
Struthers,O. Y1 ..... 3.45
Torrance,Calif. C11 .... 4.15
Weirton,W.Va. W6 .... 3.45
Youngstown C3, R2 .... 3.45

BAR SIZE ANGLES; S. SHAPES
Aliquippa,Pa. J5 ..... 3.45
Atlanta A11 ..... 3.60
Johnstown,Pa. B2 ..... 3.45
Lackawanna,N.Y. B2 .. 3.45
Niles,Calif. P1 ..... 4.17
Pittsburgh(23) J5 .... 3.45
Portland,Oreg. O4 .... 4.20
SanFrancisco S7 ..... 4.00
Weirton,W.Va. W6 .... 3.45

BAR SIZE ANGLES; H.R.CARBON
Bethlehem,Pa. B2 ..... 3.65

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 ..... 3.95
Buffalo R2 ..... 3.95
Canton,O. R2, T7 ..... 3.95
Clairton,Pa. C3 ..... 3.95
Ecorse,Mich. G5 ..... 4.25
Fontana,Calif. K1 .... 4.95
Gary,Ind. C3 ..... 3.95
Houston,Tex. S5 ..... 4.35
Ind.Harbor,Ind. I-2, Y1.3.95
Johnstown,Pa. B2 ..... 3.95
KansasCity,Mo. S5 .... 4.55
Lackawanna,N.Y. B2 .. 3.95
LosAngeles B3 ..... 5.00
Massillon,O. R2 ..... 3.95
Midland,Pa. C18 ..... 3.95
So.Chicago C3, R2, W14.3.95
So.Duquesne,Pa. C3 .... 3.95
Struthers,O. Y1 ..... 3.95
Warren,O. C17 ..... 4.20
Youngstown C3 ..... 3.95

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. C3 ..... 4.20
Fontana,Calif. K1 .... 4.95
Gary,Ind. C3 ..... 4.20
Youngstown C3 ..... 4.20

BARS & SMALL SHAPES, H. R., High-Strength Low-Alloy
Aliquippa,Pa. J5 ..... 5.20
Atlanta A11 ..... 5.35
Bessemer,Ala. T2 ..... 5.20
Bethlehem,Pa. B2 .... 5.20
Clairton,Pa. C3 ..... 5.20
Cleveland R2 ..... 5.20
Ecorse,Mich. G5 ..... 5.65
Fairfield,Ala. T2 ..... 5.20
Fontana,Calif. K1 .... 6.25
Gary,Ind. C3 ..... 5.20
Ind.Harbor,Ind. I-2 .... 5.20
IndianaHarbor,Ind. Y1 5.45
Johnstown,Pa. B2 .... 5.20
Lackawanna,N.Y. B2 .. 5.20
LosAngeles B3 ..... 5.90
Pittsburgh J5 ..... 5.20
So.Duquesne,Pa. C3 .... 5.20
So.SanFrancisco B3 ... 5.95
Struthers,O. Y1 ..... 5.45
Youngstown C3 ..... 5.20

BARS, Cold-Finished Carbon
Aliquippa,Pa. K5 ..... 4.15
Ambridge,Pa. W18 .... 4.15
BeaverFalls,Pa. M12,R2 4.15
Buffalo B5 ..... 4.15
Camden,N.J. P13 ..... 4.60
Carnegie,Pa. C12 ..... 4.15
Chicago W18 ..... 4.15
Cleveland A7, C20 .... 4.15
Detroit P17 ..... 4.30
Donora,Pa. A7 ..... 4.15
Ecorse,Mich. G5 ..... 5.65
Elyria,O. W8 ..... 4.15
FranklinPark,Ill. N5 .... 4.15
Gary,Ind. R2 ..... 4.15
Hammond,Ind. L2, M13.4.15
Hartford,Conn. R2 .... 4.55
Harvey,Ill. B5 ..... 4.15
LosAngeles R2 ..... 5.55
Mansfield,Mass. B5 .... 4.55
Massillon,O. R2, R8 ... 4.15
Midland,Pa. C18 ..... 4.15
Monaca,Pa. S17 ..... 4.15
Newark,N.J. W18 ..... 4.55
Plymouth,Mich. P5 .... 4.40
Pittsburgh J5 ..... 4.15
Putnam,Conn. W18 .... 4.55
Readville,Mass. C14 .... 4.55
St.Louis,Mo. M5 ..... 4.55
So.Chicago,Ill. W14 .... 4.15
SpringCity,Pa.(5) K3 .. 4.55
Struthers,O. Y1 ..... 4.15
Waukegan,Ill. A7 ..... 4.15
Youngstown F3, Y1 .... 4.15

BARS, Cold-Finished Alloy
Aliquippa,Pa. K5 ..... 4.90
Ambridge,Pa. W18 .... 4.90
BeaverFalls,Pa. M12 .... 4.90
Bethlehem,Pa. B2 ..... 4.90
Buffalo B5 ..... 4.90
Canton,O. R2, T7 ..... 4.90
Carnegie,Pa. C12 ..... 4.90
Chicago W18 ..... 4.90
Cleveland A7, C20 .... 4.90
Detroit P17 ..... 5.05
Donora,Pa. A7 ..... 4.90
Elyria,O. W8 ..... 4.90
Gary,Ind. R2 ..... 4.90
Hammnod,Ind. L2, M13.4.90
Hartford,Conn. R2 .... 5.20
Harvey,Ill. B5 ..... 4.90
Lackawanna,N.Y. B2 .. 4.90
Mansfield,Mass. B5 .... 5.20
Massillon,O. R2, R8 ... 4.90
Midland, Pa. C18 ..... 4.90
Monaca,Pa. S17 ..... 4.90
Newark,N.J. W18 ..... 5.20
Plymouth,Mich. P5 .... 5.10
So.Chicago,Ill. R2, W14.4.90
Struthers,O. Y1 ..... 4.90
Warren,O. C17 ..... 4.90
Waukegan,Ill. A7 ..... 4.90
Worcester,Mass. A7 .... 5.20
Youngstown F3, Y1 .... 4.90

RAIL STEEL BARS
Chicago Hts.(3) I-2, C2 .. 4.00
ChicagoHts.(4) I-2 .... 3.45
Dallas,Tex.(4) S20 .... 6.00
Franklin,Pa.(3) F5 .... 4.00
FortWorth,Tex.(26) T4.. 4.63
Huntngtn,W.Va.(3) W7.. 4.00
Marion,O.(3) P11 ..... 4.00
Moline,Ill.(3) R2 ..... 3.55
Williamsport(3) S19 .... 4.25

BARS, Wrought Iron
Economy,Pa.(S.R.) B14.8.60
Economy,Pa.(D.R.)B14 11.00
Economy(Staybolt)B14 11.30
Dover,N.J.(Staybolt)U1 15.00
Dover(Eng.Bolt) U1 ..13.50
Dover(Wrgt.Iron) U1 .12.25
McK.Rks.(S.R.) L5 ...8.60
McK.Rks.(D.R.) L5 ..11.25

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 .. 3.45
Alton,Ill(6) L1 ..... 3.45
Atlanta A11 ..... 3.60
Buffalo R2 ..... 3.45
Cleveland R2 ..... 3.45
Emeryville,Calif. J7 .. 4.20
Fairfield,Ala. T2 ..... 3.45
Fontana,Calif. K1 .... 4.10
Gary,Ind. C3 ..... 3.45
Houston,Tex. S5 ..... 3.85
Ind.Harbor,Ind. I-2, Y1.3.45
Johnstown,Pa. B2 ..... 3.45
KansasCity,Mo. S5 .... 4.05
Lackawanna,N.Y. B2 .. 3.45
LosAngeles B3 ..... 4.15
Milton,Pa. B6 ..... 3.70
Minnequa,Colo. C10 .... 4.25
Niles,Calif. P1 ..... 4.17
Pittsburg,Calif. C11 .... 4.15
Pittsburgh J5 ..... 4.15
Portland,Oreg. O4 .... 4.20
Seattle B3, N14 ..... 4.20
So.Chicago,Ill. R2 .... 3.45
So.Duquesne,Pa. C3 .... 3.45
So.SanFrancisco B3 .... 4.20
SparrowsPoint,Md. B2 .. 3.45
Struthers,O. Y1 ..... 3.45
Torrance,Calif. C11 .... 4.15
Youngstown C3, R2 .... 3.45

BARS, Reinforcing (Fabricated; to Consumers)
Huntington,W.Va. W7 .. 4.50
Johnstown, ¼-1" B2 ... 4.35
LosAngeles B3 ..... 5.00
Marion,O. P11 ..... 4.75
Seattle B3, N14 ..... 5.10
So.SanFrancisco B3 .... 5.00
SparrowsPt., ¼-1" B2 .. 4.35
Williamsport,Pa. S19 .. 4.35

SHEETS, Hot-Rolled Steel (18 gage and heavier)
AlabamaCity,Ala. R2 .. 3.35
Ashland,Ky.(8) A10 ... 3.35
Butler,Pa. A10 ..... 3.35
Cleveland J5, R2 ..... 3.35
Conshohocken,Pa. A3 .. 3.60
Detroit M1 ..... 4.15
Ecorse,Mich.(8) G5 ... 3.55
Fairfield,Ala. T2 ..... 3.35
Fontana,Calif. K1 .... 4.25
Gary,Ind. C3 ..... 3.35
GraniteCity,Ill. G4 .... 4.05
Geneva,Utah G1 ..... 3.45
Ind.Harbor,Ind. I-2, Y1.3.35
Irvin,Pa. C3 ..... 3.35
Lackawnna,N.Y. B2 .. 3.35
Munhall,Pa. C3 ..... 3.35
Niles,O. N12 ..... 4.50
Pittsburg,Calif. C11 .... 4.05
Pittsburgh J5 ..... 3.35
Sharon,Pa. S3 ..... 3.75
So.Chicago,Ill. W14 .... 3.35
SparrowsPoint,Md. B2 .. 3.35
Steubenville,O. W10 .... 3.35
Torrance,Calif. C11 .... 4.05
Warren,O. R2 ..... 3.35
Weirton,W.Va. W6 .... 3.35
Youngstown C3, Y1 .... 3.35

SHEETS, Hot-Rolled Carbon Steel (19 gage and lighter)
AlabamaCity,Ala. R2 .. 4.50
Dover,O. R1 ..... 4.65
Ind.Harbor,Ind. I-2 .... 4.40
Mansfield,O. E6 ..... 4.15
Niles,O. N12 ..... 5.00
Torrance,Calif. C11 .... 5.15

SHEETS, H-R (14 ga., heavier) High-strength Low-Alloy
Cleveland J5, R2 ..... 5.05
Conshohocken,Pa. A3 .. 5.05
Ecorse,Mich. G5 ..... 5.50
Fairfield,Ala. T2 ..... 5.05
Fontana,Calif. K1 .... 6.00
Gary,Ind. C3 ..... 5.05
Ind.Harbor,Ind. I-2 .... 5.05
IndianaHarbor,Ind. Y1 5.30
Irvin,Pa. C3 ..... 5.05
Lackawanna(35) B2 .. 5.05
Pittsburgh J5 ..... 5.05
Sharon,Pa. S3 ..... 5.40
So.Chicago,Ill. C3 .... 5.05
SparrowsPoint(36) B2 .. 5.05
Warren,O. R2 ..... 5.05
Weirton,W.Va. W6 .... 5.05
Youngstown, C3 ..... 5.05
Youngstown Y1 ..... 5.30

SHEETS, Cold-Rolled High-Strength Low-Alloy
Cleveland J5, R2 ..... 6.20
Ecorse,Mich. G5 ..... 6.65
Fontana,Calif. K1 .... 7.05
Gary,Ind. C3 ..... 6.20
Ind.Harbor,Ind. I-2 .... 6.20
IndianaHarbor,Ind. Y1 6.45
Irvin,Pa. C3 ..... 6.20
Lackawanna(37) B2 ... 6.20
Pittsburgh J5 ..... 6.20
SparrowsPoint(38) B2.. 6.20
Warren,O. R2 ..... 6.20
Weirton,W.Va. W6 .... 6.20
Youngstown Y1 6.45

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10	4.10
Cleveland J5, R2	4.10
Ecorse,Mich. G5	4.30
Fairfield,Ala. T2	4.10
Follansbee,W.Va. F4	5.10
Fontana,Calif. K1	5.00
Gary,Ind. C3	4.10
GraniteCity,Ill. G4	4.80
Ind.Harbor,Ind. I-2, Y1	4.10
Irvin,Pa. C3	4.10
LackaWanna,N.Y. B2	4.10
Middletown,O. A10	4.10
Pittsburg,Calif. C11	5.05
Pittsburgh J5	4.10
SparrowsPoint,Md. B2	4.10
Steubenville,O. W10	4.10
Warren,O. R2	4.10
Weirton,W.Va. W6	4.10
Youngstown Y1	4.10

SHEETS, Galv'd No. 10 Steel

AlabamaCity,Ala. R2	4.40
Ashland,Ky.(8) A10	4.40
Canton,O. R2	4.40
Delphos,O. N16	5.40
Dover,O. R1	4.75
Fairfield,Ala. T2	4.40
Gary,Ind. C3	4.40
GraniteCity,Ill. G4	5.10
Ind.Harbor,Ind. I-2	4.40
Irvin,Pa. C3	4.40
Kokomo,Ind. C16	*4.80*
MartinsFerry,O. W10	4.40
Niles,O. N12	5.50
Pittsburg,Calif. C11	5.15
SparrowsPoint,Md. B2	4.40
Steubenville,O. W10	4.40
Torrance,Calif. C11	5.15
Weirton,W.Va. W6	4.40

SHEETS, Galvanized No. 10, High-Strength Low Alloy

Irvin,Pa. C3	6.75
SparrowsPoint(39) B2	6.75

SHEETS, Galvanneaied Steel

Canton,O. R2	4.95
Irvin,Pa. C3	4.95
Kokomo,Ind. C16	*5.35*
Niles,O. N12	6.05

SHEETS, ZINCGRIP Steel No. 10

Butler,Pa. A10	4.65
Middletown,O. A10	4.65

SHEETS, Electro Galvanized

Cleveland R2 (2S)	5.25
Niles,O. R2 (2S)	5.25
Weirton,W.Va. W6	5.10

SHEETS, Zinc Alloy

Ind.Harbor,Ind. I-2	5.05

SHEETS, Long Terne, Steel (Commercial Quality)

BeechBottom,W.Va. W10	4.80
Gary,Ind. C3	4.80
Mansfield,O. E6	4.80
Middletown,O. A10	4.80
Niles,O. N12	5.30
Weirton,W.Va. W6	4.80

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.20

ROOFING SHORT TERNES (Package; 8 lb coated)

Gary,Ind. C3	$17.50
Yorkville,O. W10	17.50

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$6.45
Gary,Ind. C3	6.35
Irvin,Pa. C3	6.35
SparrowsPoint,Md. B2	6.45
Yorkville,O. W10	6.35

SHEETS, Lt. Coated Ternes, 6 lb

Yorkville,O. W10	$7.05

SHEETS, Mfg. Ternes, 8 lb

Gary,Ind. C3	$8.10
Warren,O. R2	8.10
Yorkville,O. W10	8.10

BLUED Stock, 29 Ga.

Yorkville,O. W10	6.00
Follansbee,W.Va.(23)F4	5.70

SHEETS, Culvert No. 16

	Cu Alloy	Cu Fe
Ashland A10	5.20	...
Canton,O. R2	5.25	5.70
Fairfield,Ala. T2	5.20	5.45
Gary C3	5.20	5.45
IndianaHarbor I-2	5.20	5.45
Irvin,Pa. C3	5.20	5.45
Kokomo C16	*5.80*	...
MartinsFy,O. W10	5.20	5.45
Pittsburg,Cal. C11	5.95	...
SparrowsPt. B2	5.20	...
Torrance,Cal. C11	5.95	...

SHEETS, Culvert, No. 16 Corrugated Ingot iron

Ashland,Ky. A10	5.45
Fairfield,Ala. T2	5.45

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland(8) A10	3.60
Cleveland R2	3.95
Ind.Harbor,Ind. I-2	3.60
Warren,O. R2	3.95

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2	4.70
Middletown,O. A10	4.60
Warren,O. R2	4.70

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10	4.65
Canton,O. R2	5.15
Ind.Harbor,Ind. I-2	4.80

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	4.90
Middletown,O. A10	4.90

SHEETS, Wrought Iron

	An'l	Galv.
Apollo,Pa. B14	12.60	16.85

SHEETS, Drum Body

Pittsburg,Calif. C11	4.05
Torrance,Calif. C11	4.05

SHEETS, ALUMINIZED

Butler,Pa. A10	7.75

SHEETS, Well Casing

Fontana,Calif. K1	4.80

TIN PLATE, American Coke (Base Box)

	1.25 lb	1.50 lb
Aliquippa J5	$7.30	$7.50
Fairfield,Ala. T2,	7.40	7.60
Gary C3	7.30	7.50
Ind.Harbor I-2, Y1	7.30	7.50
Irvin,Pa. C3	7.30	7.50
Pitts.Cal. C11	8.05	8.25
Sp.Pt.,Md. B2	7.40	7.60
Warren R2	7.30	7.50
Weirton W6	7.30	7.50
Yorkville,O. W10.	7.30	7.50

CANMAKING BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$5.60
Fairfield,Ala. T2	5.70
Gary,Ind. C3	5.60
GraniteCity,Ill. G4	5.80
Ind.Harbor,Ind. I-2, Y1	5.60
Irvin,Pa. C3	5.60
Niles,O. R2	5.60
Pittsburg,Calif. C11	6.35
SparrowsPoint,Md. B2	5.70
Warren,O. R2	5.60
Weirton,W.Va. W6	5.60
Yorkville,O. W10	5.60

HOLLOWARE ENAMELING Black Plate (29 gage)

Aliquippa,Pa. J5	5.30
Follansbee,W.Va. F4	5.30
Gary,Ind. C3	5.30
GraniteCity,Ill. G4	5.50
Ind.Harbor,Ind. Y1	5.30
Irvin,Pa. C3	5.30
Niles,O. R2	5.75
SparrowsPoint,Md. B2	5.40
Warren,O. R2	5.30
Yorkville,O. W10	5.30

SHEETS, Enameling Iron

Ashland,Ky.(8) A10	4.40
Cleveland R2	4.40
Ecorse,Mich. G5	4.70
Gary,Ind. C3	4.40
GraniteCity,Ill. G4	5.10
Ind.Harbor,Ind. I-2	4.40
Irvin,Pa. C3	4.40
Middletown,O. A10	4.40
Youngstown Y1	4.40

STRIP, Hot-Rolled, High-Strength Low-Alloy

Atlanta(9) A11	5.10
Bessemer,Ala. T2	4.95
Conshohocken,Pa. A3	4.95
Ecorse,Mich. G5	*5.40*
Fairfield,Ala. T2	4.95
Fontana,Cal. K1	5.90
Gary,Ind. C3	4.95
Ind.Harb.,Ind. I-2, Y-1	4.95
Lackawanna,N.Y. B2	4.95
LosAngeles(25) B3	5.70
Sharon,Pa. S3	5.30
So.SanFrancisco(25) B3	5.70
SparrowsPoint,Md. B2	4.95
Warren,O. R2	4.95
Weirton,W.Va. W6	4.95
Youngstown C3, Y1	4.95

STRIP, Hot-Rolled Alloy

Bridgeprt.Conn.(10) S15	5.10
Carnegie,Pa. S18	*5.45*
Fontana,Calif. K1	6.30
Gary,Ind. C3	5.10
Houston,Tex. S5	5.50
KansasCity,Mo. S5	5.70
NewBritn.Conn.(10) S15	5.10
Sharon,Pa. S3	5.45
Youngstown C3	5.10

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	3.50
Warren,O. R2	3.85

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	3.25
Alton,Ill.(1) L1	3.25
Ashland,Ky.(8) A10	3.25
Atlanta A11	3.40
Bessemer,Ala. T2	3.25
Bridgeprt,Conn.(10) S15	*3.75*
Buffalo(27) R2	3.25
Butler,Pa. A10	3.25
Carnegie,Pa. S18	*3.75*
Conshohocken,Pa. A3	3.50
Detroit M1	4.05
Ecorse,Mich. G5	3.45
Fairfield,Ala. T2	3.25
Fontana,Calif. K1	4.40
Gary,Ind. C3	3.25
Houston, Tex. S5	3.65
Ind.Harbor,Ind. I-2, Y1	3.25
KansasCity,Mo.(9) S5	3.85
Lackawanna,N.Y. B2	3.25
LosAngeles B3	4.00
Milton,Pa. B6	3.50
Minnequa,Colo. C10	4.30
NewBritain(10) S15	*3.75*
N.Tonawanda,N.Y. B11	3.25
Pittsburg,Calif. C11	4.00
Riverdale,Ill. A1	3.25
SanFrancisco S7	4.00
Seattle B3, N14	4.25
Sharon,Pa. S3	3.75
So.Chicago,Ill. W14	3.25
So.SanFrancisco B3	4.00
SparrowsPoint,Md. B2	3.25
Torrance,Calif. C11	4.00
Warren,O. R2	3.25
Weirton,W.Va. W6	3.25
WestLeechburg,Pa. A4	3.50
Youngstown C3, Y1	3.25

STRIP, Cold-Rolled Alloy Steel

Bridgeprt,Conn.(10) S15	9.50
Carnegie,Pa. S18	*10.10*
Cleveland A7	9.50
Dover,O. G6	*10.00*
Fontana,Calif. K1	11.15
Harrison,N.J. C18	*10.00*
NewBritn.Conn.(10) S15	9.50
Pawtucket,R.I.(11) NS	9.50
Pawtucket,R.I.(12) NS	9.80
Sharon,Pa. S3	10.10
Worcester,Mass. A7	9.80
Youngstown C8	9.50

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	4.75

STRIP, Cold-Finished, Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61 0.80C	0.81-1.05C	1.06-1.35C
Bridgeport,Conn.(10) S15	*4.85*	*6.30*	*6.90*	*8.85*	*11.15*
Bristol,Conn. W1	...	...	6.85	8.80	...
Carnegie,Pa. S18	...	*6.30*	*6.90*	*8.85*	*11.15*
Cleveland A7	4.15	5.95	6.55	8.50	10.80
Dover,O. G6	*5.00*	*6.30*	*6.90*	*8.85*	*11.15*
FranklinPark,Ill. T6	4.50	6.10	6.70	8.65	...
Harrison,N.J. C18	...	...	6.85	8.80	11.10
Mattapan,Mass. T6	4.65	6.25	6.85	8.80	11.10
NewBritn.,Conn.(10) S15	*4.85*	*6.30*	*6.90*	*8.85*	*11.15*
NewCastle,Pa. B4	*4.85*	*6.30*	*6.90*	*8.85*	...
NewCastle,Pa. E5	4.50	5.95	6.55	8.50	10.80
NewYork W3	...	6.30	6.90	8.85	11.15
Pawtucket,R.I. NS:					
Cleve-or-Pitts.Base	4.70	5.95	6.55	8.50	10.80
Worcester,Base	4.65	6.25	6.85	8.80	11.10
Sharon,Pa. S3	4.85	6.30	6.90	8.85	11.15
Trenton,N.J. R5	...	6.25	6.85	8.80	11.10
Wallingford,Conn. W2	4.65	6.25	6.85	8.80	11.10
Weirton,W.Va. W6	4.15	5.95	6.55	8.50	10.80
Worcester,Mass. A7	4.45	6.25	6.85	8.80	11.10
Worcester,Mass. T6	4.65	6.25	6.85	8.80	11.10
Youngstown C8	4.15	5.95	6.55	8.50	10.80
Spring Steel (Tempered)					
Trenton,N.J. R5	...	...	9.30	11.25	13.85
Harrison,N.J. C18	...	...	9.30	11.25	13.85

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6	*5.00*
Berea,O. C7	6.90
Bridgeprt,Conn.(10) S1	*4.85*
Butler,Pa, A10	4.15
Cleveland A7, J5	4.15
Dearborn,Mich. D3	4.75
Detroit D2	4.75
Detroit M1	4.95
Dover,O. (40) G6	*5.00*
Ecorse,Mich. G5	4.35
Follansbee,W.Va. F4	4.85
Fontana,Calif. K1	5.75
FranklinPark,Ill. T6	4.50
Ind.Harbor,Ind. I-2	4.30
Lackawanna,N.Y. B2	4.15
LosAngeles C1	5.85
Mattapan,Mass. T6	5.00
Middletown,O. A10	4.15
NewBritain(10) S15	*4.85*
NewCastle,Pa. B4	*4.85*
NewCastle,Pa.(40) E5	4.50
NewHaven,Conn. D2	5.00
NewHaven,Conn. A7	4.65
New York W3	5.00
Pawtucket,R.I. R3	5.15
Pawtucket,R.I.(21) NS	5.00
Riverdale,Ill. A1	4.50
Rome,N.Y. R6	4.15
Sharon,Pa. S3	4.85
SparrowsPoint,Md. B2	4.15
Trenton,N.J. R5	*5.50*
Wallingford,Conn. W2	5.00
Warren,O.(40) T5	4.50
Warren,O. R2	4.15
Weirton,W.Va. W6	4.15
Youngstown C8, (40)	4.50
Youngstown Y1	4.15

STRIP, Cold-Rolled, High-Strength Low-Alloy

Cleveland A7, J5	6.20
Dover,O. G6	*6.80*
Ecorse,Mich. G5	*6.05*
Fontana,Calif. K1	6.95
Lackawanna,N.Y. E2	6.40
Sharon,Pa. S3	6.55
SparrowsPoint,Md. B2	6.40
Warren,O. R2	6.20
Weirton,W.Va. W6	6.20
Youngstown Y1	6.20

STRIP, Electro Galvanized

Dover,O. G6	*5.00*
Weirton,W.Va. W6	4.15
Youngstown C8	4.15

TIN PLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$6.35	$6.60	$6.85
Fairfield,Ala. T2	6.45	6.70	6.95
Gary,Ind. C3	6.35	6.60	6.85
GraniteCity,Ill. G4	6.55	6.80	7.05
Ind.Harbor,Ind. I-2, Y1	6.35	6.60	6.85
Irvin,Pa. C3	6.35	6.60	6.85
Niles,O. R2	6.35	6.60	6.85
Pittsburg,Calif. C11	7.10	7.35	7.60
SparrowsPoint,Md. B2	6.45	6.70	6.95
Weirton,W.Va. W6	6.35	6.60	6.85
Yorkville,O. W10	6.35	6.60	6.85

SHEETS, SILICON, H.R. or C.R.(22 Ga.) COILS (Cut Lengths ½c lower)

	Field	Armature	Electric	Motor	Dynamo
BeechBottom W10(cut lengths)	...	...	6.70	7.95	8.75
Brackenridge,Pa. A4	...	...	7.20	8.45	9.25
GraniteCity,Ill.G4(cut lengths)	...	...	7.40	8.65	...
Ind.Harbor,Ind. I-2	6.40	6.70	(34)	...	...
Mansfield,O. E6 (cut lengths)	5.90	6.20	6.70	7.95	8.75
Niles,O. N12 (cut lengths)	...	6.50	7.00	...	...
Vandergrift,Pa. C3	...	6.70	7.20	8.45	9.25
Warren,O. R2	6.40	6.70	7.20	8.45	9.25
Zanesville,O. A10	...	6.70	7.20	8.45	9.25

SHEETS, SILICON (22 Ga. Base) Coils (Cut Lengths ½c lower)

Transformer Grade	72	65	58	52
BeechBottom W10 (cut lengths)	9.30	9.85	10.55	11.35
Brackenridge,Pa. A4	9.80	10.35	11.05	...
Vandergrift,Pa. C3	9.80	10.35	11.05	11.85
Warren,O. R2	9.80	...	...	...
Zanesville,O. A10	9.80	10.35	11.05	11.85

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)

	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)	...	...	14.20	14.70
Vandergrift,Pa. C3	12.35	13.20	14.20	14.70

Key to Producing Companies

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.
B1 Babcock & Wilcox Tube
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Boiardi Steel Corp.
B8 Braeburn Alloy Steel
B11 Buffalo Bolt Co.
B14 A.M. Byers Co.
C1 Calif. Cold Rolled Steel
C2 Calumet Steel Div., Borg-Warner Corp.
C3 Carnegie-Illinois Steel
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve.Cold.Roll.Mills Co.
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia Steel Co.
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.
E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.
F2 Firth Sterling Steel
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
G1 Geneva Steel Co.
G2 Globe Iron Co.
G3 Globe Steel Tubes Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
H1 Hanna Furnace Corp.
H4 Heppenstall Co.
I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.
K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K5 Kidd Drawn Steel Co.
L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Electric Steel
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

TIGHT COOPERAGE HOOP

Atlanta,A11	3.40
Riverdale,Ill. A1	3.40
Sharon,Pa. S3	3.90
Youngstown C3	3.40

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5	5.90
Alton,Ill.(1) L1	5.90
Bartonville,Ill. (1) K4	5.90
Buffalo W12	5.90
Cleveland A7	5.90
Donora,Pa. A7	5.90
Duluth A7	5.90
Fostoria,O. S1	*6.20*
Johnstown,Pa. B2	5.90
Los Angeles B3	6.85
Millbury,Mass.(12) N6	6.20
Monessen,Pa. P7, P16	5.90
Palmer,Mass. W12	6.20
Pittsburg,Calif. C11	6.85
Portsmouth,O. P12	5.90
Roebling,N.J. R5	6.20
So.Chicago,Ill. R2	5.90
SparrowsPoint,Md. B2	6.00
Struthers,O. Y1	5.90
Trenton,N.J. A7	6.20
Waukegan,Ill. A7	5.90
Williamsport,Pa. B2	6.00
Worcester A7,J4,T6,W12	6.20
Worcester,Mass. N6	6.20

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	*5.70*
Buffalo W12	5.35
Cleveland A7	5.35
Crawfordsville,Ind. MS	5.35
Dover,O. G6	*5.70*
Fostoria,O. S1	5.50
Kokomo,Ind. C16	5.35
FranklinPark,Ill. T6	5.70
Massilion,O. R8	5.35
Monessen,Pa. P16	5.35
Monessen,Pa. P7	5.60
Pawtucket,R.I.(12) N8	6.00
Trenton,N.J. R5	5.65
Worcester A7, T6, W12	5.65

WIRE, Fine and Weaving (8-in. Coils)

Bartonville,Ill.(1) K4	8.45
Buffalo W12	8.45
Chicago W13	8.45
Cleveland A7	8.45
Crawfordsville,Ind. MS	8.45
Fostoria,O. S1	*8.90*
Johnstown,Pa. B2	8.45
Kokomo,Ind. C16	8.45
Monessen,Pa. P16	8.45
Palmer,Mass. W12	8.75
Portsmouth,O. P12	8.45
Roebling,N.J. R5	8.75
Waukegan,Ill. A7	8.45
Worcester,Mass. A7, T6	8.75

WIRE, Tire Bead

Bartonville,Ill.(1) K4	10.55
Monessen,Pa. P16	10.80
Roebling,N.J. R5	10.80

WIRE, Manufacturers Bright, Low-Carbon

AlabamaCity,Ala. R2	4.50
Aliquippa,Pa. J5	4.50
Atlanta A11	4.60
Alton,Ill.(1) L1	4.50
Bartonville,Ill.(1) K4	4.50
Buffalo W12	4.50
Chicago W13	4.50
Cleveland A7, C20, R2	4.50
Crawfordsville,Ind. MS	4.60
Donora,Pa. A7	4.50
Duluth A7	4.50
Fairfield,Ala. T2	4.50
Fostoria,O. (24) S1	*5.00*
Houston S5	4.90
Johnstown,Pa. B2	4.50
Joliet,Ill. A7	4.50
KansasCity,Mo. S5	5.10
Kokomo,Ind. C16	*4.85*
Los Angeles B3	5.45
Minnequa,Colo. C10	4.75
Monessen,Pa. P7	4.75
Newark, 6-Sga. I-1	5.15
No. Tonawanda B11	4.50
Palmer,Mass. W12	4.80
Pittsburg,Calif. C11	5.45
Portsmouth,O. P12	4.50
Rankin,Pa. A7	4.50
So.Chicago,Ill. R2	4.50
So.SanFrancisco C10	5.45
SparrowsPoint,Md. B2	4.60
Sterling,Ill.(1) N15	*4.80*
Struthers,O. Y1	4.50
Torrance,Calif. C11	5.45
Waukegan,Ill. A7	4.50
Worcester,Mass. A7	4.80
Worcester,Mass. T6	4.95

WIRE, Upholstery Spring

Aliquippa,Pa. J5	5.55
Alton,Ill.(1) L1	5.55
Buffalo W12	5.55
Cleveland A7	5.55
Donora,Pa. A7	5.55
Duluth A7	5.55
Johnstown,Pa. B2	5.55
LosAngeles B3	6.50
Monessen,Pa. P7, P16	5.55
NewHaven,Conn. A7	5.85
Palmer,Mass. W12	5.85
Pittsburg,Calif. C11	6.50
Portsmouth,O. P12	5.55
Roebling,N.J. R5	5.85
So.Chicago,Ill. R2	5.55
SparrowsPoint,Md. B2	5.65
Struthers,O. Y1	5.55
Torrance,Calif. C11	6.50
Trenton,N.J. A7	5.85
Waukegan,Ill. A7	5.55
Worcester,Mass. A7	5.85

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4	8.15
Monessen,Pa. P16	8.15
Roebling,N.J. R5	8.15
SparrowsPoint,Md. B2	8.25

ROPE WIRE

	Mild Plow	Plow	Imp. Plow
Bartonville,Ill. K4	8.05	8.05	8.30
Buffalo W12	8.05	8.05	8.30
Cleveland A7	8.05	8.05	8.30
Donora,Pa. A7	8.05	8.05	8.30
Fostoria,O. S1	*8.35*	*8.35*	*8.60*
Johnstown,Pa. B2	8.05	8.05	8.30
Monessen,Pa. P16	8.05	8.05	8.30
Monessen,Pa. P7	8.30	8.30	8.55
NewHaven,Conn. A7	8.35	8.35	8.60
Palmer,Mass. W12	8.35	8.35	8.60
Portsmouth,O. P12	8.05	8.05	8.30
Roebling,N.J. R5	8.35	8.35	8.60
SparrowsPoint,Md. B2	8.15	8.15	8.40
Struthers,O. Y1	8.05	8.05	8.30
Trenton,N.J. A7	8.35	8.35	8.60
Waukegan,Ill. A7	8.05	8.05	8.30
Williampsort,Pa. B2	8.15	8.15	8.40
Worcester,Mass. J4, T6	8.35	8.35	8.60

WIRE, Merchant Quality (6 to 8 gage)

	An'ld	Galv.
AlabamaCity R2	5.35	5.60
Aliquippa J5	5.35	5.80
Atlanta A11	5.45	5.70
Bartonville(19) K4	*5.35**	*5.80*
Buffalo(31) W12	4.50	...
Cleveland A7	5.35	5.60
Crawfordsvil. MS	5.45	5.95
Donora A7	5.35	5.60
Duluth A7	5.35	5.60
Fairfield T2	5.35	5.60
Houston,Tex. S5	5.75	6.00
Johnstown B2	5.35	5.60
Joliet,Ill. A7	5.35	5.60
KansasCy,Mo. S5	5.95	6.20
Kokomo C16	*5.70*	*5.95*
LosAngeles B3	6.30	...
Minnequa C10	*5.60**	*6.10*
Monessen P7	5.60	5.85
Palmer(31) W12	4.80	...
Pitts.,Cal. C11	6.30	6.55
Prtsmth.(18) P12	5.35	5.60
Rankin A7	5.35	5.60
So.Chicago R2	5.35	5.60
So.S.Fran. C10	*6.30**	*6.80*
SparrowsPt. B2	5.45	5.70
Sterling,Ill.(1)N15	*5.65*	*5.85**
Struthers,O. Y1	5.35	5.60
Torrance,Cal. C11	6.30	...
Worcester A7	5.65	5.90

*Unchanged.

WIRE (16 gage)

	An'ld Stone	Galv. Stone
Aliquippa J5	9.80	11.50
Bartonville(1) K4	*9.80**	*11.50*
Cleveland A7	9.80	11.30
Crawfrdvil. MS	9.80	11.30
Fostoria,O. S1	*10.40*	*12.40*
Kokomo C16	9.80	11.30
Johnstown B2	9.80	11.30
Kokomo C16	9.80	11.30
Minnequa C10	*10.05**	*12.05*
Palmer,Mass. W12	9.80	11.30
Pitts.,Cal. C11	10.15	11.65
Prtsmth.(18) P12	9.80	11.30
SparrowsPt. B2	9.90	11.40
Waukegan A7	9.80	11.30

*Unchanged.

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	126
Aliquippa,Pa. J5	130
Atlanta A11	128
Bartonville,Ill.(19) K4	126
Crawfordsville MS	135
Donora,Pa. A7	126
Duluth,Minn. A7	126
Fairfield,Ala. T2	126
Houston,Tex. S5	134
Johnstown,Pa. B2	126
Joliet,Ill. A7	126
KansasCity,Mo. S5	138
Kokomo,Ind. C16	*138*
Minnequa,Colo. C10	*136*
Monessen,Pa. P7	133
Pittsburg,Calif. C11	146
Portsmouth,O.(18) P12	126
Rankin,Pa. A7	126
So.Chicago,Ill. R2	126
So.SanFran.,Calif. C10	*151*
SparrowsPoint,Md. B2	128
Sterling,Ill.(1) N15	133

FENCE POSTS

	Col.
ChicagoHts.,Ill. C2	125
Duluth A7	116
Franklin,Pa. F5	125
Huntington,W.Va. W7	125
Johnstown,Pa. B2	*125*
Joliet,Ill. A7	116
Marion,O. P11	125
Minnequa,Colo. C10	121
Moline,Ill. R2	112
So.Chicago R2	116
Williamsport,Pa. S19	130

WOVEN FENCE, 9-15½ Ga. Col.

AlabamaCity,Ala. R2	116
Ala.City,Ala.,17-18ga.R2	198
Aliquippa,Pa.9-14½ga.J5	120
Atlanta A11	118
Bartonville,Ill.(19) K4	116
Crawfordsville,Ind. MS	123
Donora,Pa. A7	116
Duluth A7	116
Houston,Tex. S5	124
Fairfield,Ala. T2	116
Johnstown,Pa. B2	116
Johnstn,17ga.6" B2	190
Johnstn,17ga.,4" B2	193
Joliet,Ill. A7	116
KansasCity,Mo. S5	128
Kokomo,Ind. C16	*123*
Minnequa,Colo. C10	*128*
Monessen,Pa. P7	123
Pittsburg,Calif. C11	139
Portsmouth,O.(18) P12	116
Rankin,Pa. A7	116
So.Chicago,Ill. R2	116
Sterling,Ill.(1) N15	*118*

BALE TIES, Single Loop Col.

AlabamaCity,Ala. R2	113
Atlanta A11	114
Bartonville,Ill.(19) K4	113
Chicago W13	113
Crawfordsville MS	120
Donora,Pa. A7	113
Duluth A7	113
Fairfield,Ala. T2	113
Joliet,Ill. A7	113
KansasCity,Mo. S5	125
Kokomo,Ind. C16	*120*
Minnequa,Colo. C10	118
Pittsburg,Calif. C11	137
So.Chicago,Ill. R2	113
So.SanFran.,Calif. C10	137
SparrowsPoint,Md. B2	115
Sterling,Ill.(1) N15	*119*

AXLES

Ind.Harbor,Ind. S13	5.25
Johnstown,Pa. B2	5.25

JOINT BARS

Bessemer,Pa. C3	4.40
Fairfield,Ala. T2	4.40
Ind.Harbor,Ind. I-2	4.40
Joliet,Ill. C3	4.40
Lackawanna,N.Y. B2	4.40
Minnequa,Colo. C10	4.40
Steelton,Pa. B2	4.40

STANDARD TRACK SPIKES

Ind.Harbor,Ind. I-2, Y1	5.60
KansasCity,Mo. S5	5.85
Lebanon,Pa. B2	5.60
Minnequa,Colo. C10	5.60
Pittsburgh J5	5.60
Seattle B3	6.10
So.Chicago,Ill. R2	5.60
Struthers,O. Y1	5.60
Youngstown R2	5.60

NAILS & STAPLES, Stock

To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	106
Aliquippa,Pa. J5	110
Atlanta A11	108
Bartonville,Ill.(19) K4	106
Chicago,Ill. W13	106
Cleveland A9	111
Crawfordsville,Ind. MS	112
Donora,Pa. A7	106
Duluth A7	106
Fairfield,Ala. T2	106
Galveston,Tex. D7	114
Houston,Tex. S5	114
Johnstown,Pa. B2	106
Joliet,Ill. A7	106
KansasCity, Mo. S5	118
Kokomo,Ind. C16	*112*
Minnequa,Colo. C10	111
Monessen,Pa. P7	112
Pittsburg,Calif. C11	125
Portsmouth,O. P12	106
Rankin,Pa. A7	106
So.Chicago,Ill. R2	106
SparrowsPoint,Md. B2	108
Sterling,Ill.(1) N15	*112*
Torrance,Calif. C11	126
Worcester,Mass. A7	112

NAILS & STAPLES, Non-Stock

AlabamaCity,Ala. R2	5.35
Bartonville,Ill.(19) K4	5.35
Crawfordsville,Ind. MS	5.90
Donora,Pa. A7	5.35
Duluth A7	5.35
Johnstown,Pa. B2	5.35
Joliet,Ill. A7	5.35
Kokomo,Ind. C16	*5.65*
Minnequa,Colo. C10	5.60
Pittsburg,Calif. C11	6.30
Portsmouth,O. P12	5.35
Rankin,Pa. A7	5.35
So.Chicago,Ill. R2	5.35
SparrowsPoint,Md. B2	5.45
Sterling,Ill.(1) N15	*5.65*
Worcester,Mass. A7	5.65

NAILS, Cut (100 lb keg)

To dealers (33)	
Conshohocken,Pa. A3	$6.75
Wheeling,W.Va. W10	6.75

TIE PLATES

Fairfield,Ala. T2	4.20
Gary,Ind. C3	4.20
Ind.Harbor,Ind. I-2	4.20
Lackawanna,N.Y. B2	4.20
Minnequa,Colo. C10	4.20
Pittsburg,Calif. C11	4.35
Seattle B3	4.35
Steelton,Pa. B2	4.20
Torrance,Calif. C11	4.35
Weirton,W.Va. W6	4.20

TRACK BOLTS (20) Treated

KansasCity,Mo. S5	9.10
Lebanon,Pa.(32) B2	8.85
Minnequa,Colo. C10	9.10
Pittsburgh O3, P14	9.10
Seattle B3	9.35

RAILS

	Std. No. 1	Std. No. 2	Std. All No. 2	TeeRails 60 lb Under
Bessemer,Pa. C3	3.40	3.30	3.35	3.75
Ensley,Ala. T2	3.40	3.30	...	3.75
Fairfield,Ala. T2	...	...	...	3.75
Gary,Ind. C3	3.40	3.30	3.35	...
Huntington,W.Va. W7	...	...	...	3.75
Ind.Harbor,Ind. I-2	3.40	3.30	3.35	...
Johnstown,Pa. B2	...	...	...(16)	3.75
Lackawanna B2	3.40	3.30	...	3.75
Minnequa,Colo. C10	3.40	3.30	...	4.25
Steelton,Pa. B2	3.40	3.30	...	...
Williamsport,Pa. S19	...	...	...	4.00

TOOL STEELS

Grade	Cents per lb	Grade	Cents per lb
Reg. Carbon	21.00	18W,4Cr,3V	126.00
Extra Carbon	24.50	18W,4Cr,2V,9Co	185.50
Spec. Carbon	29.50-31.50	18W,4Cr,2V,6Co	169.50
Oil Hardening	32.00	18.25W,4.25Cr,1V,4.75Co	156.50
Cr Hot Wrk.	32.00	20.25W,4.25Cr,1.6V,12.25Co	293.50
Hi-Carbon-Cr	57.50	1.5W,4Cr,1V,8.5Mo	71.50
18W,4Cr,1V	100.00	6.4W,4.5Cr,1.9V,5Mo	76.50
18W,4Cr,2V	113.00	6W,4Cr,3V, 6Mo	97.00

Tool steel producers include: A4, AS, B2, B8, C4, C9, C13, C18, D4, F2, H4, J3, L3, M14, S8, T7, U4, V2, V3.

Key to Producing Companies

M1	McLouth Steel Corp.
M4	Mahoning Valley Steel
M5	Medart Co.
M6	Mercer Tube & Mfg. Co.
M8	Mid-States Steel & Wire
M9	Midvale Co.
M10	Missouri-Illinois Furnace
M12	Moltrup Steel Products
M13	Monarch Steel Co.
M14	McInnes Steel Co.
N2	National Supply Co.
N3	National Tube Co.
N5	Nelson Steel & Wire Co.
N6	New Eng. HighCarb.Wire
N8	Newman-Crosby Steel
N12	Niles Rolling Mill Co.
N14	Nrthwst.Steel Roll. Mills
N15	Northwestern S.&W. Co.
N16	New Delphos Mfg. Co.
O3	Oliver Iron & Steel Corp.
O4	Oregon Steel Mills
P1	Pacific States Steel Corp.
P2	Pacific Tube Co.
P4	Phoenix Iron & Steel Co.
P5	Pilgrim Drawn Steel
P6	Pittsburgh Coke&Chem.
P7	Pittsburgh Steel Co.
P9	Pittsburgh Tube Co.
P11	Pollak Steel Co.
P12	Portsmouth Division, Detroit Steel Corp.
P13	Precision Drawn Steel
P14	Pits.Screw & Bolt Co.
P15	Pittsburgh Metallurgical
P16	Page Steel & Wire Div., Amer. Chain & Cable
P17	Plymouth Steel Co.
R1	Reeves Steel & Mfg. Co.
R2	Republic Steel Corp.
R3	Rhode Island Steel Corp.
R5	Roebling's Sons, John A.
R6	Rome Strip Steel Co.
R7	Rotary Electric Steel Co.
R8	RelianceDiv.,EatonMfg.
S1	Senaca Wire & Mfg. Co.
S3	Sharon Steel Corp.
S5	Sheffield Steel Corp.
S6	Shenango Furnace Co.
S7	Simmons Co.
S8	Simonds Saw & Steel Co.
S9	Sloss-Sheffield,S.&I. Co.
S13	Standard Forgings Corp.
S14	Standard Tube Co.
S15	Stanley Works
S16	Struthers Iron & Steel
S17	Superior Drawn Steel Co.
S18	Superior Steel Corp.
S19	Sweet's Steel Co.
S20	Southern States Steel
T2	Tenn.Coal, Iron & R.R.
T3	Tenn.Prod. & Chem.
T4	Texas Steel Co.
T5	Thomas Steel Co.
T6	Thompson Wire Co.
T7	Timken Roller Bearing
T9	Tonawanda Iron Div. Am. Rad. & Stan. San.
U1	Ulster Iron Works
U4	Universal Cyclops Steel
V2	Vanadium Alloys Steel
V3	Vulcan Crucible Steel Co.
W1	Wallace Barnes Co.
W2	Wallingford Steel Co.
W3	Washburn Wire Co.
W4	Washington Steel Corp.
W6	Weirton Steel Co.
W7	W. Va. Steel & Mfg. Co.
W8	West.Auto.Mach.Screw
W9	Wheatland Tube Co.
W10	Wheeling Steel Corp.
W12	Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13	Wilson Steel &Wire Co.
W14	Wisconsin Steel Div. International Harvester
W15	Woodward Iron Co.
W16	Worth Steel Co.
W18	Wyckoff Steel Co.
Y1	Youngstown Sheet&Tube

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant. (4) Reinforcing.
(5) Philadelphia del.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pittsburgh base.
(12) Worcester, Mass. base.
(14) Also wide flange beams.
(15) ½" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pittsburgh base.
(20) Deduct 0.25c for untreated.
(21) New Haven, Conn. base.
(22) Del. San Fran. Bay area.
(23) 14 gage.
(24) Deduct 0.20c for finer than 15 gage.
(25) Bar mill bands.
(26) Reinforcing, to fabricators (⅜" bar elec. furn. billet, 5.05c); to consumers, 5.25c.
(27) Bar mill sizes.
(28) Bonderized.
(31) Not annealed.
(32) Untreated.
(33) To jobbers, deduct 20 cents.
(34) 6.70c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 15 gage & lighter; 60" & narrower.
(38) 14 gage & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 5.25c, 0.035" and heavier.

STANDARD PIPE, T. & C.

BUTTWELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Black A	Black B	Black C	Galvanized D	Galvanized E	Galvanized F
⅛	5.5c	0.24	36.5	34.5	33.5	5.5	3.5	5.5
¼	6.0	0.42	33.5	31.5	30.5	5.5	3.5	6.5
⅜	6.0	0.57	29.0	27.0	26.0	0.5	+1.5	2.5
½	8.5	0.85	40.5	38.5	39.5	21.0	19.0	20.0
¾	11.5	1.13	43.5	41.5	42.5	25.0	23.0	24.0
1	17.0	1.68	46.0	44.0	45.0	28.0	26.0	27.0
1¼	23.0	2.28	46.5	44.5	45.5	28.5	26.5	27.5
1½	27.5	2.73	47.0	45.0	46.0	29.0	27.0	28.0
2	37.0	3.68	47.5	45.5	46.5	29.5	27.5	28.5
2½	58.5	5.82	48.0	46.0	47.0	30.0	28.0	29.0
3	76.5	7.62	48.0	46.0	47.0	30.0	28.0	29.0

Column A: Etna, Pa. N2; Monaca, Pa. P9; Sharon, Pa. M6; Butler, Pa. ⅛-⅜", F6; Benwood, W. Va., 1½ percentage points lower on ⅛", 2 points lower on ¼", 3 points lower on ⅜", W10. Wheatland, Pa., 2 points lower on ⅛" through ⅜", W9. Following make ½" and larger: Lorain, O. N3; Youngstown, plus 43% on 3½" and 4", R2; Youngstown Y1; Aliquippa, Pa. J5. Fontana, Calif. K1 quotes 11 points lower on ½" and larger continuous weld and 31% on 3½" and 4".

Columns B & E: Sparrows Point, Md. B2.

Columns C & F: Indiana Harbor, Ind., ½" through 3", Y-1; Alton, Ill. (Lorain, O., base) L1.

Column D: Monaca, Pa. quotes 1 pt lower on ½" through 3", P9; Sharon, Pa. M6, quotes 2½ pts. lower on ⅛", 1½ pts lower on ⅜" and 3½ pts lower on ½" through 3"; Butler, Pa. ⅛" through ⅝" F6; Benwood, W. Va. W10 except 3½ pts lower on ⅛", 2½ pts lower on ¼", 3 pts lower on ⅜", 2½ lower on ½", 3½ lower on ¾", 1¼", 1½" and 2", 3 lower on 2½" and 3", and 4 lower on 1"; Wheatland, Pa., except 2 pts lower on ⅛", ¼" and ⅜"; W9. Following make ½" and larger: Lorain, N3; Youngstown, plus 24.5% on 3½" and 4", R2; Youngstown, Y1; Aliquippa, Pa. J5 and Etna, Pa. N2 quote 2½ pts lower on ½", 3½ lower on ¾", 1¼", 1½", and 2", 3 lower on 2½" and 3", and 4 lower on 1". Fontana, Calif. K1 quotes 8 pts lower on ½" and larger continuous weld and 15.5% on 3½" and 4".

SEAMLESS AND ELECTRIC WELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Seamless Black A	Seamless Galv. B	Elec. Weld Black C	Elec. Weld Galv. D
2	37.0c	3.68	36.0	17.5	36.0	17.5
2½	58.5	5.82	39.0	20.5	39.0	20.5
3	76.5	7.62	39.0	20.5	39.0	20.5
3½	92.0	9.20	41.0	22.5	41.0	22.5
4	$1.09	10.89	41.0	22.5	41.0	22.5
5	1.48	14.81	41.0	22.5	41.0	22.5
6	1.92	19.18	41.0	22.5	41.0	22.5

Column A: Aliquippa J5; Ambridge N2; Lorain N3; Youngstown Y1.

Column B: Aliquippa J5 quotes 3 points lower on 2", 2½ pts lower on 2¼-6 in.; Lorain, N3; Youngstown, Y1.

Columns C & D: Youngstown R2.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
1	13	12.36	14.39	13.96	13.96
1¼	13	14.63	17.05	14.19	16.54
1½	13	16.17	19.02	15.68	18.45
1¾	13	18.39	21.64	17.84	20.99
2	13	20.61	24.24	19.99	23.51
2¼	13	22.96	27.03	22.27	26.22
2½	12	25.29	29.76	24.53	28.87
2½	12	27.71	32.58	26.88	31.60
2¾	12	29.36	34.53	28.48	33.49
3	12	30.82	36.27	29.90	35.18
3¼	11	35.87	42.22	34.79	40.95
3½	11	38.52	45.35	37.36	43.99

Boiler tube producers include Babcock & Wilcox Tube Co., National Tube Co., Globe Steel Tubes Co., Pittsburgh Steel Co., Republic Steel Corp., Standard Tube Co.

CLAD STEELS

(Cents per pound)

Cladding Stainless	Plates 10% Carbon Base	Plates 20% Carbon Base	Strip Cold-Rolled 10% Carbon Base	Strip Cold-Rolled Both Sides	Sheets 10% Carbon Base	Sheets 20% Carbon Base	Sheets Cu Base Both Sides
302	....	....	....	....	19.75	21.50–24.00	77.00
304	23.50	26.50–28.00	....	....	20.75–23.50	22.50–25.50	77.00
309	29.00	33.50	....	....	....	....	....
310	35.00	39.50	....	....	....	....	144.00
316	28.00	31.00–32.50	....	....	26.00	28.00–34.50	....
317	33.00	37.50	....	....	....	....	....
318	32.00	36.50	....	....	....	....	....
321	25.00	29.50	....	....	23.00	25.00	111.00
347	26.00	29.00–30.50	....	....	24.00	26.00–31.50	130.00
405	19.75	26.25	....	....	....	....	....
410	19.25	25.75	....	....	....	....	....
Nickel	31.00	41.00	33.50	45.00	....	....	....
Inconel	39.00	51.00	....	....	....	....	165.00
Monel	32.00	42.00	....	....	....	....	....
Copper*	....	....	21.45†	27.15‡	....	....	....

* Deoxidized. † 17.95c for hot-rolled. ‡ 23.90c for hot-rolled. Production points for carbon base products: Stainless plates, sheet, Conshohocken, Pa. A3 and New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. W16, Coatesville, Pa. L7 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; nickel, monel, copper-clad strip, Carnegie, Pa., S18. Production point for copper-base sheets is Carnegie, Pa. A13.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants; per cent off list for less than case lots to consumers)

6 in. and shorter:	
½-in. & smaller diam.	23
⅝-in. & ⅞-in.	26
1-in. and larger	26
Longer than 6 in.:	
All diams.	22
Lag bolts, all diams.:	
6 in. and shorter	30
over 6 in. long	28
Ribbed Necked Carriage	26
Blank	40
Plow	40
Step, Elevator, Tap, and Sleigh Shoe	28
Tire bolts	20
Boiler & Fitting-Up bolts	37

NUTS

H.P. & C.P. Square:	Reg.	Heavy
½-in. & smaller	23	23
⅝-in. & ⅞-in.	20	15
1-in.-1½-in.	23	10
1⅝ in. & larger	16	10
H.P. Hex.:		
½-in. & smaller	33	29
⅝-in. & ⅞-in.	24	15
1-in.-1½-in.	20	11
1⅝ in. & larger	17	11
C.P. Hex.:		
½-in. & smaller	33	29
⅝-in. & ⅞-in.	30	25
1-in. & 1½-in.	27	20
1⅝ in. & larger	20	15

SEMIFINISHED NUTS

American Standard

(Per cent off list for less than case or keg quantities)

	Hvy.	Reg.
½-in. & smaller	35	41
⅝-in. & ⅞-in.	29	36
1-in.-1½-in.	23	31
1⅝-in. & larger	17	21
Light		
⅞-in. & smaller		41
1-in. to ⅝-in.		35
¾-in. to 1½-in.		33

STEEL STOVE BOLTS

(F.o.b. plant; per cent off list in packages)

Plain finish	56 & 10
Plated finishes	41 & 10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:	
⅝-in. & smaller	47
¾-in. through 1 in.	40
Longer than 6 in.:	
⅝-in. & smaller	33
¾-in. through 1 in.	13

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam. x 6 in. and shorter	44
1 in. and smaller diam. x over 6 in.	33

HEADLESS SET SCREWS

(Packaged; per cent off list)

½ in. and smaller	41
¼-in. diam. & larger	24
N.F. thread, all diams.	18

RIVETS

F.o.b. midwestern plants

Structural ½-in., larger 7.25c

7/16-in. under .....43 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers .....List to 50c off

ELECTRODES

(Threaded, with nipples, unboxed, f.o.b. plant)

GRAPHITE

Inches Diam.	Inches Length	Cents per lb
17,18,20	60,72	16.00
8 to 16	48,60,72	16.50
7	48,60	17.75
6	48,60	19.00
4,5⅛	40	19.50
3	40	20.50
2½	24,30	21.00
2	24,30	23.00

CARBON

40	100,110	7.50
35	100,110	7.50
30	84,110	7.50
24	72 to 104	7.50
17 to 20	34,90	7.50
14	60,72	8.00
10,12	60	8.25

STAINLESS STEEL

(Cents per pound)

Type	Sheets	C.R. Strip	Bars Wire Structurals
301	39.00	32.00	30.00
302	39.00	34.50	30.00
303	41.00	38.00	32.50
304	41.00	36.50	31.50
309	53.50	52.50	43.00
316	54.50	56.50	47.50
321	47.00	46.00	35.50
347	51.50	50.00	40.00
410	34.50	28.50	24.50
416	35.00	35.00	25.00
420	42.00	45.00	30.00
430	37.00	29.00	25.00
501	25.50	24.00	13.00
502	26.50	25.00	14.00

Baltimore, Types 301 through 347 sheet, except 309 E2.

Baltimore, bars, wire and structural A10.

Brackenridge, Pa., sheets A4.

Bridgeville, Pa., bars, wire, sheets & strip U4.

Butler, Pa., sheets and strip except Types 303, 309, 416, 420, 501 & 502 A10.

Carnegie, Pa., strip except Type 416, S18.

Cleveland, strip A7.

Detroit, strip, except Types 303, 309, 321, 416, 420, 501 and 502 M1.

Dunkirk, N.Y., bars, wire A4.

Duquesne, Pa., bars C3.

Fort Wayne, Ind., bars and wire, except Types 501 and 502 J6.

Gary, Ind., sheets except Type 416 C3.

Harrison, N. J., strip C18.

Harrison, N. J., Types 302, 304, 316 wire and strip D6.

Massillon, all products R2.

McKeesport, Pa., bars, sheets except Type 416 C3.

McKeesport, Pa., bars & wire except Types 301, 309, 501 & 502; strip Types 410 & 430 only F2.

Middletown, O., sheets except Types 303, 416, 420, 501 and 502 A10.

Midland, sheets & strip C18.

Munhall, Pa., bars C3.

Pittsburgh, sheets C18.

Reading, Pa., bars & strip C4.

Sharon, Pa., strip, except Types 303, 309, 316, 416, 501 and 502 S3.

So. Chicago, Ill., bars & structurals C3.

Syracuse, N. Y., bars, wire & structurals C18.

Titusville, Pa., bars, U4.

Wallingford, Conn., strip, except 309, W2 quotes 0.25 cents higher.

Washington, Pa., bars, sheets & strip J3.

Washington, Pa., Types 301 through 347 sheets & strip as listed except 303 & 309; 316 sheets 59.50c, strip 61.50c W4.

Watervliet, N. Y., structurals & bars A4.

Waukegan, bars & wire A7.

West Leechburg, Pa., strip, A4.

Youngstown, strip C8.

COAL, CHEMICALS

Spot, cents per gallon, ovens

Pure benzol 30.00-32.00

Toluol, one deg...21.00-28.00

Industrial xylol ..21.00-29.50

Per ton bulk, ovens

Sulphate of ammonia .$32-45

Cents per pound, ovens

Phenol, 40 (carlots, non-returnable drums) ..17.25

Do., less than carlots..18.00

Do., tank cars 15.50

FLUORSPAR

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, corloads, effective CaF_2 content, 70% or more, $41; less than 60%, $38.

Imported, net ton, duty paid, metallurgical grade, $28-$29.

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted.)

	Cents
Storage iron 98+% Fe, carlots	15.00
Swedish, c.i.f. New York, in bags	7.40-8.50
Electrolytic Iron:	
Annealed, 99.5% Fe	39.50
Unannealed, 99+% Fe	33.50
Unannealed 99+% Fe(minus 325 mesh)	48.50
Powder Flakes	44.50
Carbonyl Iron:	
97.9-99.8%, size 5 to 10 microns	70.00-135.00
Aluminum:	
Carlots, freight allowed	27.00
Atomized, 500 lb drums, freight allowed	30.00
Brass, 10-ton lots	28.50-31.25
Copper:	
Electrolytic	33.75
Reduced	33.50
Lead	20.50
Manganese:	
Minus 100-mesh	52.00
Minus 35 mesh	48.00
Minus 200 mesh	56.00
Nickel unannealed	75.50
Nickel-Silver, 10-ton lots	41.75
Silicon	34.00
Solder (plus cost of metal)	8.50
Stainless Steel, 302	75.00
Tin	$1.20
Zinc, 10-ton lots	20.50-28.00

Tungsten:	Dollars
99%, minus 80 to 200 mesh, freight allowed:	
over 1000 lb	2.90
1000 lb	2.95
less than 1000 lb.	3.00
98.8% minus 65 mesh, freight allowed:	
1000 lb and over	2.90
less than 1000 lb	3.00
Molybdenum:	
99%, minus 80 to 200 mesh, over 500 lb	2.25
200 to 500 lb	2.60
less than 200 lb	2.75
82-88%, freight allowed, 2000 lb and over	2.40
less than 2000 lb	2.45
Chromium, electrolytic 99% Cr min.	3.50

METALLURGICAL COKE

Price per net ton

BEEHIVE OVENS

Connellsvll.fur.	$14.00-14.50
Connellsvll.fdry.	16.00-17.00
New River, foundry	19.00
Wise county, foundry	15.95
Wise county, furnace	15.20

OVEN FOUNDRY COKE

Kearney, N. J., ovens	$22.75
Everett, Mass., ovens	
New England, del.	*24.30*
Chicago, ovens	21.00
Chicago del.	†22.45
Detroit, del.	24.91
Terre Haute, ovens	22.50
Milwaukee, ovens	23.00
Indianapolis, ovens	22.00
Chicago, del.	25.37
Cincinnati, del.	24.92
Detroit, del.	25.90
Ironton, O., ovens	20.40
Cincinnati, del.	22.71
Painesville, O., ovens	23.25
Buffalo, del.	25.37
Cleveland, del.	24.97
Erie, Pa., ovens	22.50
Birmingham, ovens	19.15
Birmingham, del.	20.20
Philadelphia, ovens	22.10
Neville Island, Pa., ovens	22.00
Swedeland, Pa., ovens	22.00
St. Louis, ovens	22.99
St. Louis, del.	24.12
Portsmouth, O., ovens	20.15
Cincinnati, del.	22.71
Detroit, ovens	23.00
Detroit, del.	*24.00
Buffalo, del.	26.04
Flint, del.	25.44
Pontiac, del.	24.39
Saginaw, del.	25.75

Includes representative switching charge of: *, $1.00; †, $1.45, one-track charge being $1.20, two tracks $1.40, and three or more tracks $1.50. ‡ Or within $4.15 freight zone from works.

WAREHOUSE STEEL PRODUCTS

(Prices, cents per pound, for delivery within switching limits, subject to extras)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140§		Carbon	Floor
New York(city)	5.82	6.84	7.84	6.14	...	5.97	6.64	8.60	5.95	6.18	7.64
New York(c'try)	5.52	6.64	7.54	5.84	...	5.67	6.34	8.70	5.65	5.88	7.34
Boston (city)	5.95	6.75	7.89	5.90	...	5.80	6.39	8.70	5.95	6.58	7.48
Boston (c'try)	5.75	6.55	7.69	5.70	...	5.60	6.19	8.50	5.75	6.38	7.28
Phila. (city)	6.60-6.70	6.75	7.20	5.90	...	5.85	6.46	8.40	5.70	5.90	7.00
Phila. (c'try)	6.35-6.45	6.50	6.95	5.65	...	5.60	6.21	8.15	5.45	5.65	6.75
Balt. (city)	5.35	6.59	6.77	5.79	...	5.79	6.39	...	5.89	5.60	7.24
Balt. (c'try)	5.15	6.39	6.57	5.59	...	5.59	6.19	...	5.69	5.40	7.04
Norfolk, Va.	6.10	...	...	6.30	...	6.15	7.20	...	6.20	6.15	7.55
Richmond, Va.	5.55	...	6.80	5.83	...	5.73	6.30	...	5.83	5.65	7.33
Wash (w'hse)	5.56	6.80	6.73	6.00	...	6.00	6.62	...	6.10	5.81	7.45
Buffalo (del.)	5.35	6.15	7.10	5.61	...	5.35	5.95	10.10††5	5.55	5.85	7.15
Buffalo (w'hse)	5.15	5.95	6.90	5.41	...	5.15	5.75	9.90††5	5.35	5.65	6.95
Pitts. (w'hse)	5.15	5.95*	6.70-6.95	5.20	6.15	5.10	5.75	9.55††	5.25	5.35	6.60
Detroit (w'hse)	5.33	6.08*	7.09	5.49	...	5.39	5.91	9.86††5	5.64	5.79	6.88
Cleveland (del.)	5.35	6.15	7.50	5.44	6.35	5.32	5.95	8.31	5.57	5.72	6.92
Cleve. (w'hse)	5.15	5.95	7.30	5.24	6.15	5.12	5.75	8.16	5.37	5.52	6.72
Cincin. (city)	5.57	6.14	6.54	5.50	...	5.50	6.11	...	5.79	5.94	7.10
Chicago (city)	5.35	6.15	7.15	5.30	...	5.30	5.85	9.75††5	5.45	5.60	6.80
Chicago (w'hse)	5.15	5.95	6.95	5.10	...	5.10	5.65	9.55††5	5.25	5.40	6.60
Milwaukee(city)	5.49	6.29	7.29	5.44	...	5.44	6.09	9.89††5	5.59	5.74	6.94
Milwau. (c'try)	5.29	6.09	7.09	5.24	...	5.24	5.89	9.69††5	5.39	5.54	6.74
St. Louis (del.)	5.68	6.48	7.28	5.63	...	5.63	6.28	10.08††5	5.78	5.93	7.13
St. L. (w'hse)	5.48	6.28	7.08	5.43	...	5.43	6.08	9.88††5	5.58	5.73	6.93
Kans. City(city)	5.95	6.75	7.60	5.90	...	5.90	6.55	...	6.05	6.20	7.60
KansCity(w'hse)	5.75	6.55	7.40	5.70	...	5.70	6.35	...	5.85	6.00	7.40
Omaha, Nebr.	6.13‡	...	8.33	6.13	...	6.18	6.98	...	6.18	6.38	7.83
Birm'ham (del.)	5.30	6.10	6.30[2]	5.25	...	5.25	6.88	...	5.40	5.70	7.83
Birm'hm(w'hse)	5.15	5.95	6.15[2]	5.10	...	5.10	...	...	5.25	5.55	...
Los Ang. (city)	6.10	7.65	7.90	6.15	8.90	6.10	7.75	...	6.10	6.20	8.40
L. A. (w'hse)	5.90	7.45	7.70	5.95	8.70	5.90	7.55	...	5.90	6.00	8.20
San Francisco	6.50[9]	7.60[3]	7.50[2]	7.45[9]	8.25[2]	6.30[9]	7.55	...	6.30[9]	6.40[9]	8.50[9]
Seattle-Tacoma	6.60	8.15[3]	...	6.85	...	6.35	8.50	10.10	6.20	6.35[7]	8.40[7]

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes extra for 10 gage; § as rolled; †† as annealed. Base quantities, 2000 to 9999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; [2]—500 to 1499 lb; [3]—450 to 1499 lb; [5]—1000 to 1999 lb; [7]—300 to 999 lb; [9]—400 to 9999 lb.

REFRACTORIES

(Prices per 1000 bricks, f.o.b. plant)

FIRE CLAY BRICK

Super Duty: St. Louis, Vandalia, Farber, Mexico, Mo., Olive Hill, Hayward, Ashland, Ky., Clearfield, Curwensville, Pa., Ottawa, Ill., $116.60. Hard-fired, St. Louis, Vandalia, Mo., Olive Hill, Ky., $156.20.

High-Heat Duty: Salina, Pa. $99.60; Woodbridge, N. J., St. Louis, Farber, Vandalia, Mexico, Mo., West Decatur, Orviston, Clearfield, Beach Creek, Curwensville, Lumber, Lockhaven, Pa., Olive Hill, Hitchins, Haldeman, Ashland, Ky., Troup, Athens, Tex., Stevens Pottery, Ga., Bessemer, Ala., Portsmouth, Oak Hill, O., Ottawa, Ill., $94.60.

Intermediate-Heat Duty: St. Louis, Farber, Vandalia, Mo., West Decatur, Orviston, Beach Creek, Curwensville, Lumber, Lockhaven, St. Marys, Clearfield, Pa., Olive Hill, Hitchins, Haldeman, Ashland, Hayward, Ky., Athens, Troup, Tex., Stevens Pottery, Ga., Portsmouth, O., Ottawa, Ill., $88; Bessemer, Ala., $79.20.

Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Orviston, Pa., $79.20; Parral, O., $78.50; St. Marys, Pa., $76; Ottawa, Ill., $70.

LADLE BRICK

Dry Press: Chester, New Cumberland, W. Va., $60; Freeport, Merill Station, Clearfield, Pa., Irondale, Wellsville, O., $66.

Wire Cut: Chester, New Cumberland, W. Va., $58; Wellsville, O., $64.

MALLEABLE BUNG BRICK

St. Louis, Vandalia, Farber, Mo., Olive Hill, Ky., $105.60; Beach Creek, Pa., $94.60; Ottawa, Ill., $90.

SILICA BRICK

Mt. Union, Claysburg, or Sproul, Pa., Portsmouth, O., Ensley, Ala., $94.60; Hays, Pa., $100.10; Joliet, Rockdale, Ill., E. Chicago, Ind., $104.50; Lehi, Utah, Los Angeles, $111.10.

Eastern Silica Coke Oven Shapes (net ton): Claysburg, Mt. Union, Sproul, Pa., Birmingham, $92.40.

Illinois Silica Coke Oven Shapes (net ton): Joliet or Rockdale, Ill., E. Chicago, Ind., Hays, Pa., $93.50.

BASIC BRICK

Per net ton, Baltimore or Chester, Pa. Burned chrome brick, $73; chemical-bonded chrome brick, $77; magnesite brick, $99; chemical-bonded magnesite, $88.

MAGNESITE

Per net ton, Chewelah, Wash. Domestic dead-burned, ¾" grains; bulk, $36.30; single paper bags, $41.80.

DOLOMITE

Per net ton. Domestic, burned bulk; Bonne Terre, Mo., $12.15; Martin, Millersville, Narlo, Clay Center, Woodville, Gibsonburg, Bettsville, O., Billmeyer, Plymouth Meeting, Blue Bell, Williams, Pa., Millville, W. Va., $13.

ORES

LAKE SUPERIOR IRON ORE

Gross ton, 51½% (natural), lower lake ports. After Jan. 25, 1950, increases or decreases, if any, in upper lake rail freight, dock handling charges and taxes thereon are for buyer's account.

Old range bessemer	$8.10
Old range nonbessemer	7.95
Mesabi bessemer	7.85
Mesabi nonbessemer	7.70
High phosphorus	7.70

EASTERN LOCAL ORE

Cents per unit, del. E. Pa.

Foundry and basic 56.62% concentrates contract	16.00

FOREIGN ORE

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	17.00
Long-term contract	15.00
North African hematites	15.75
Brazilian iron ore, 68-69%	18.00

TUNGSTEN ORE

Net ton unit, duty paid

Chinese	$36.00
Brazilian	36.00
Bolivian	36.00
Domestic scheelite, del.	36.00

MANGANESE ORE

Long term contracts, nominal; nearby, 48%, duty paid, 79.8c-81.8c per long ton unit, c.i.f. U. S. ports; prices on lower grades adjusted to manganese content and impurities.

CHROME ORE

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African	
48% 2.8:1	$32.50
48% 3:1	35.00-36.00
48% no ratio	26.00
South African Transvaal	
44% no ratio	$17.00-18.00
45% no ratio	17.30-18.30
48% no ratio	26.00
50% no ratio	27.00-27.50
Brazilian	
44% 2.5:1 lump	$32.00
Rhodesian	
45% no ratio	$20.00-21.00
48% no ratio	26.00
48% 3:1 lump	35.00-36.00
Domestic—rail nearest seller	
48% 3:1	$39.00

MOLYBDENUM

Sulphide concentrates per lb, molybdenum content, mines	$0.90

FERROALLOYS

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton, $70, Palmerton, Pa.; $71, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $172 per gross ton of alloy, c.l., packed, $184; gross ton lots, packed, $199; less gross ton lots, packed, $216; f.o.b. Alloy, W. Va., Niagara Falls, N. Y., or Welland, Ont. Base price: $174, f.o.b. Birmingham and Johnstown, Pa., furnaces, $172, Sheridan, Pa.; $175, Etna, Pa. Shipment from Pacific Coast warehouses by one seller add $33 to above prices, f.o.b. Los Angeles, San Francisco, Portland, Oreg. Shipment from Chicago warehouse, ton lots, $214; less gross ton lots, $231 f.o.b. Chicago. Add or subtract $2.15 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 24.75c per lb of contained Mn, carload packed 25.5c, ton lot 26.6c, less ton 27.8c, Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 75% C—max. 7% Si. **Special Grade:** (Mn 90% min., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max). Carload, lump, bulk 18.15c per lb of contained Mn, carload packed 18.9c, ton lot 20.0c, less ton 21.2c. Delivered. Spot, add 0.25c.

Manganese Metal, 2" x D (Mn 96% min., Fe 2% max., Si 1% max., C 0.2% max.): Carload lump bulk, 29c per lb of metal; packed, 29.75c; ton lot 31.25c; less ton lot 33.25c. Delivered. Spot, add 2c.

Manganese, Electrolytic: 250 lb to 1999 lb, 32c; 2000 to 39,999 lb, 30c; 40,000 lb or more, 28c. Premium for hydrogen-removed metal 1.5c per pound, f.o.b. cars Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 8.95c per lb of alloy, carload packed, 9.70c, ton lot 10.60c, less ton 11.60c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. Spot, add 0.25c.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk, 20.5c per lb of contained Cr, c.l., packed 21.4c, ton lot 22.55c, less ton 23.95c. Delivered. Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

(*Please turn to page 126*)

Copper and Zinc Supplies Tighten

Tonnages available for civilian purposes dwindle as a steadily increasing amount is earmarked for DO, rated requirements. Tin advances to new all-time high

New York—Consumers of copper and zinc for nonmilitary purposes are feeling the pinch of dwindling supplies. Orders with DO ratings issued by National Production Authority are being presented to suppliers in a steadily increasing volume. With tonnages required to fill rated orders withdrawn from civilian consuming channels, the shortage of metals approaches the critical stage.

Suppliers are awaiting a clarification from NPA regarding the priorities regulation. There is widespread confusion among suppliers whether a holder of a DO rating should receive metal for civilian needs plus tonnage for defense work. In most instances, suppliers are applying priority tonnages against the customer's normal allotments.

Copper — Producers and custom smelters are booking business cautiously and on a strictly allocation basis at 24.50c, delivered. Shipments to domestic manufacturers totaled 119,529 tons in September, an increase of 7446 tons over August deliveries, reports the Copper Institute, this city. These figures do not include deliveries of copper for government account. It is estimated in the trade that if such shipments were included, the total would aggregate about 139,000 tons for September and 126,000 tons for August. At the end of September, stocks of refined copper at refineries amounted to 58,748 tons, an increase of 7796 tons.

Production of crude copper from primary sources held steady at 79,901 tons, but output from secondary sources dropped sharply to only 5884 tons from a revised figure of 11,760 tons for August. This reflected chiefly the shortage of red metal scrap. Refinery output increased about 3400 tons to a total of 111,842 tons.

Zinc—Many consumers of zinc have been forced to curtail their operations drastically due to the scarcity of metal. Pending a clarification from NPA, producers are not shipping supplemental tonnages for civilian needs after having processed a customer's DO rated orders. Sales on the Commodity Exchange are still being done for October delivery at prices above 27.00c.

Lead—Suppliers of lead have practically no metal available for October delivery and are restricting acceptance of November business to tonnages shipped in recent months. Prices are steady in the domestic market on the basis of 15.80c, St. Louis, and 16.00c, New York, while prices range up to 16.50c, f.a.s. Gulf ports, on the export market.

Tin—Prices advanced to new all-time highs last week, with Straits spot selling up to $1.125 per pound for spot delivery. Price strength is attributed to the worsening situation in Indo China and the prospective reduction in shipments of metal from that important producing area. Consumers in this country are showing little buying interest, prefering to await a decline in the market. These interests look forward to more stable market conditions following the meeting of world producers.

Tin Conference—Clarence W. Nichols of the state department will be the United States delegate to a conference called by the United Nations to discuss whether there should be international control on international trade in tin. He will be accompanied by advisors from the government and private industry. The conference, scheduled for Oct. 25, will discuss what should be done "to meet the special difficulties which exist or are expected to arise concerning tin." If the conferees find it desirable, they will conclude an international commodity agreement on tin. Basis for the discussion will be a draft international agreement on tin prepared by the International Tin Study Group.

The United States government has been against negotiating any international commodity agreement on tin, but has decided to take part in the conference "because of its interest in the world's tin position," an official of the state department said.

Midvale Smelter Reopened

Boston—U. S. Smelting, Refining & Mining Co. is reopening its Midvale smelter, south of Salt Lake City, after a shutdown of almost three weeks because of an ore shortage. The shortage resulted from a fire at the company's Lark mine. Although the mine still is not being operated, ore shipments from other mines will permit the smelter to resume operation.

New Antimony, Tungsten Tariffs

Washington—New United States tariff rates on antimony and tungsten will become effective Dec. 11. The rates on antimony regulus or metal, which were 1 cent a pound under the Chinese concession, will revert to the old rate of 2 cents a pound. The rates on needle and liquated antimony will remain unchanged at 0.25 cents. The rate on tungsten ore or concentrates will be 50 cents a pound (metallic tungsten content) compared with the present rate of 38 cents a pound.

Fairchild Licenses German Firm

Farmingdale, N. Y.—Fairchild Engine & Airplane Corp., this city, granted rights in Germany for the use of the Al-Fin process of molecularly bonding aluminum to ferrous metals to Metallgesellschaft, A.G., Frankfurt-on-Main, Germany. The agreement with the Frankfurt firm is the third foreign license granted by Fairchild.

Metallgesellschaft is one of Europe's largest nonferrous metalworking combines, operating mines and smelters, as well as foundries. Bimetallic components which take advantage of the best features of both metals, uniting aluminum's lightweight, heat dissipation ability and corrosion resistance with the strength and wear resistance of steel can be produced by the Al-Fin process which joins the two metals inseparably.

The original application of the process was in the construction of improved aircraft engine cylinder barrels with bonded aluminum cooling fins. Since the end of the war numerous other applications have been developed.

Aluminum Product Shipments Up

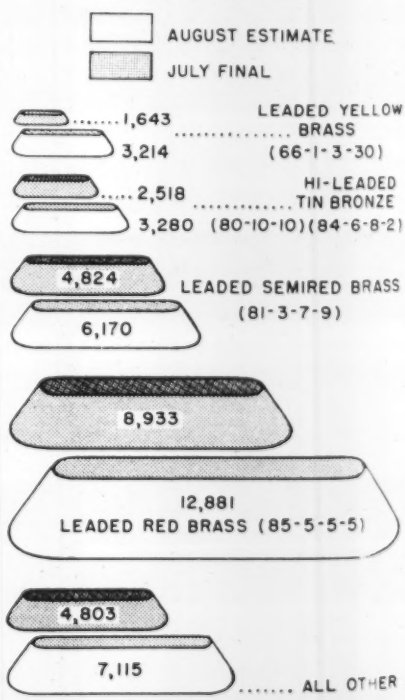
Washington—Aluminum wrought product daily shipping rate increased 10 per cent in August over July and was over twice the August, 1949, figure. Total shipments came to 169,062,000 pounds in August compared with 133,600,000 in July and 80,196,000 in August, 1949. Shipments for the first eight months amounted to 1,058,160,000 pounds compared with 782,123,000 pounds in the like 1949 period. The increase from July was general in all types of aluminum wrought products with the principal increase being in plate, sheet and strip shipments.

Shipments of magnesium wrought products during August, on an average working-day basis, were 19 per cent below July but were 64 per cent above August, 1949.

Brass Ingot Output Gains

. . . up 9939 tons in August

(Figures are in net tons)



NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 24.50c, Conn. Valley; Lake 24.62½c, delivered.

Brass Ingot: 85-5-5-5 (No. 115) 27.00c; 88-10-2 (No. 215) 39.00c; 80-10-10 (No. 305) 31.00c; No. 1 yellow (No. 405) 23.75c.

Zinc: Prime western 17.50c; brass special 17.75c; intermediate 18.00c, East St. Louis; high grade 18.60c, delivered.

Lead: Common 15.80c; chemical 15.90c; corroding 15.90c, St. Louis.

Primary Aluminum: 99% plus, ingots 19.00c, pigs 18.00c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb c.l. orders.

Secondary Aluminum: Piston alloys 27.25-28.00c; No. 12 foundry alloy (No. 2 grade) 26.75-27.50c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 28.00-28.50c; grade 2 27.00-27.50c; grade 3, 26.50-27.00c; grade 4, 26.00-26.50c. Prices include freight at c.l. rate up to 75 cents per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over 24.50c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt 113.00c, Oct. 112.75c, Nov. 112.50c; Dec. 112.00c; Jan. 111.50c.

Antimony: American 99-99.8% and over but not meeting specifications below 32.00c; 99.8% and over (arsenic 0.05% max.; other impurities 0.1% max.) 32.50c; f.o.b. Laredo, Tex., for bulk shipments. Foreign, 99%; Chinese 34.00c; English, 32.75c; Belgian, 32.75c, duty paid, New York.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 48.00c; 25-lb pigs, 50.50c; "XX" nickel shot, 51.50c; "F" nickel shot or ingots, for addition to cast iron, 48.50c. Prices include import duty.

Mercury: Open market, spot, New York $90-$95 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $30.00 per lb contained Be, f.o.b., Cleveland and Reading, Pa.

Cadmium: "Regular" straight or flat forms, $2.40 del.; special or patented shapes $2.65.

Cobalt: 97-99%, $1.80 per lb for 500 lb (keg); $1.82 per lb for 100 lb (case); $1.87 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York, 72.75c per oz.

Platinum: $100-103 per ounce from refineries.

Palladium: $24 per troy ounce.

Iridium: $220 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, cents per pound, f.o.b. mill)

Sheet: Copper 39.93-40.93; yellow brass 36.86-37.53; commercial bronze, 95%, 39.91-40.86; 90%, 39.48-40.38; red brass, 85% 38.54-39.39; 80% 38.12-38.92; best quality, 38.40; nickel silver, 18%, 50.57-51.16; phosphor-bronze, grade A, 5%, 58.49-59.45.

Rods: Copper, hot-rolled 35.78-36.78; cold-drawn 37.03-38.03; yellow brass free cutting, 31.26-31.88; commercial bronze, 95% 39.60-40.55; 90% 39.17-40.07; red brass 85% 38.23-39.08; 80% 37.81-38.61.

Seamless Tubing: Copper 39.97-40.97; yellow brass 39.87-40.54; commercial bronze 90% 42.14-43.04; red brass 85% 41.45-42.30; 80% 41.83.

Wire: Yellow brass 37.15-37.82; commercial bronze, 95% 39.72-40.20; 90% 39.77-40.67; red brass, 85% 38.83-39.68; 80% 38.41-39.21; best quality brass 38.69.

Copper Wire: Bare, soft, f.o.b. eastern mills, c.l. 28.67, l.c.l. 29.17, 100,000 lb lots 28.545; weatherproof, f.o.b. eastern mills, c.l. 29.60, l.c.l. 30.10, 100,000 lb lots 29.35; magnet, del., 15,000 lb or more 34.50, l.c.l. 35.25.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders.

Sheets and Circles: 2S and 3S mill finish c.l.

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	30.1	...	...
0.135-0.096	12-48	30.6	...	...
0.095-0.077	12-48	31.2	29.1	33.2
0.076-0.061	12-48	31.8	29.3	33.4
0.060-0.048	12-48	32.1	29 5	33.7
0.047-0.038	12-48	32.5	29.8	34.0
0.037-0.030	12-48	32.9	30.2	34.6
0.029-0.024	12-48	33.4	30.5	35.0
0.023-0.019	12-36	34.0	31.1	35.7
0.018-0.017	12-36	34.7	31.7	36.6
0.016-0.015	12-36	35.5	32.4	37.6
0.014	12-24	36.5	33.3	38.9
0.013-0.012	12-24	37.4	34.0	39.7
0.011	12-24	38.4	35.0	41.2
0.010-0.0095	12-24	39.4	36.1	42.7
0.009-0.0085	12-24	40.6	37.2	44.4
0.008-0.0075	12-24	41.9	38.4	46.1
0.007	12-18	43.3	39.7	48.2
0.006	12-18	44.8	41.0	52.8

* Lengths 72 to 180 inches. † Maximum diameter, 26 inches.

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or distance across flats	—Round— R317-T4, 17S-T4	R317-T4	——Hexagonal—— R317-T4	17S-T4
0.125	52.0	....	....	
0.156-0.188	44.0	....	....	
0.219-0.313	41.5	....	....	
0.375	40.0	46.0	48.0	
0.406	40.0	....	....	
0.438	40.0	46.0	48.0	
0.469	40.0	....	....	
0.500	40.0	46.0	48.0	
0.531	40.0	....	....	
0.563	40.0	....	45.0	
0.594	40.0	....	....	
0.625	40.0	43.5	45.0	
0.688	40.0	....	45.0	
0.750-1.000	39.0	41.0	42.5	
1.063	39.0	....	41.0	
1.125-1.500	37.5	39.5	41.0	
1.563	37.0	....	....	
1.625	36.5	....	39.5	
1.688-2.000	36.5	....	....	

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more $21.00 per cwt; add 50c cwt, 10 sq ft to 140 sq ft. Pipe: Full coils $21.00 per cwt. Traps and bends: List prices plus 60%

ZINC

Sheets, 23.50-23.75c, f.o.b. mill 36,000 lb and over. Ribbon zinc in coils, 22.50-23.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 21.50-22.00c; over 12-in., 22.50-23.00c.

"A" NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 69.00c. Strip, cold-rolled, 77.00c. Rods and shapes, 65.00c. Plates, 67.00c. Seamless tubes, 98.00c.

MONEL

(Base prices, f.o.b mill)

Sheets, cold-rolled 53.00c. Strip cold-rolled 56.00c. Rods and shapes, 51.00c. Plates, 52.00c. Seamless tubes, 86.00c. Shot and blocks, 46.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.31 in. in diameter, less than 25 lb. 55.00-62.00c; 25 to 99 lb, 45.00-52.00c; 100 lb to 5000 lb, 41.00c.

Plating Materials

Chromic Acid: 99.9% flake, f.o.b. Philadelphia, carloads, 27.00c; 5 tons and over 27.50c; 1 to 5 tons, 28.00c; less than 1 ton 28.50c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed; Flat untrimmed 37.50c; oval 37.09c; cast 35.62c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 1000 lb 55.6c, under 1000 lb 57.6c, f.o.b. Niagara Falls, N. Y.

Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 19.00c; 1000 to 19,000 lb, 18.00c, f.o.b. Niagara Falls, N. Y. Packaged in 100 lb drums add ½-cent.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 200 lb, 19.25c; over 200 lb 28.25c, f.o.b. Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 65.00c; 10,000 to 30,000 lb, 63.00c; 3000 to 10,000 lb, 67.00c, 500 to 3000 lb, 68.00c; 100 to 500 lb, 70.00c; under 100 lb, 73.00c; f.o.b. Cleveland.

Nickel Chloride: 100-lb kegs, 33.50c; 400-lb bbl, 31.50c up to 10,000 lb, 31.00c over 10,000 lb, f.o.b. Cleveland, freight allowed on barrels, or 4 or more kegs.

Tin Anodes: Bar, 1000 lb and over, nom.; 500 to 999 lb, nom.; 200 to 499 lb, nom.; less than 200 lb, nom.; ball, 1000 lb and over, nom.; 500 to 999 lb, nom.; 200 to 499 lb, nom.; less than 200 lb, nom.; f.o.b. Sewaren, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers nom.; 100 or 300 lb drums only, 100 to 500 lb, nom.; 600 to 1900 lb, nom.; 2000 to 9900 lb, nom.; f.o.b. Sewaren, N. J. Freight not exceeding St. Louis rate allowed.

Zinc Cyanide: 100 lb drums, less than 10 drums 47.7c, 10 or more drums 45.7c, f.o.b. Niagara Falls, N. Y.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb nom.; more than 2000 lb, nom., f.o.b. Carteret, N. J.

Stannous Chloride (Anhydrous): In 400 lb bbl, nom.; 100 lb kegs nom., f.o.b. Carteret, N. J.

Scrap Metals

BRASS MILL ALLOWANCES

Prices in cents per pound for less than 15,000 lb, f.o.b. shipping point.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	23.00	23.00	22.25
Yellow Brass	20.125	19.875	18.875
Commercial Bronze			
95%	21.875	21.625	21.125
90%	21.75	21.50	21.00
Red brass			
85%	21.50	21.25	20.75
80%	21.375	21.125	20.625
Muntz metal	19.00	18.75	18.25
Nickel, silver, 10%	22.25	22.00	11.125
Phos. bronze, A	24.00	23.75	22.75

BRASS INGOT MAKERS' BUYING PRICES

(Cents per pound, delivered eastern refineries, carload lots)

No. 1 copper 21.75; No. 2 copper 20.75; light copper 19.75; composition red brass 20.00; radiators 16.50; heavy yellow brass 16.00.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 21.75; No. 2 copper 20.75; light copper 19.75; refinery brass (60% copper) per dry copper content 20.00.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Copper and brass: Heavy copper and wire, No. 1 22.00-22.50; No. 2 21.00-21.50; light copper 19.00-19.50; No. 1 composition red brass 17.25-17.50; No. 1 composition turnings 16.75-17.25; mixed brass turnings 11.50-12.00; new brass clippings 17.50-18.00; No. 1 brass rod turnings 16.00-16.50; light brass 11.00-11.25; heavy yellow brass 13.50; new brass rod ends 16.50-17.00; auto radiators 13.75-14.00; cocks and faucets, 16.25-16.50; brass pipe 16.75-17.00.

Lead: Heavy 13.75-14.00; battery plates 8.25-8.50; linotype and stereotype 14.50-14.75; electrotype 12.75-13.00; mixed babbitt 12.25-12.50.

Zinc: Old zinc 11.00-11.25; new die cast scrap 10.75-11.00; old die cast scrap 8.00-8.25.

Tin: No. 1 pewter 60.00-62.00; block tin pipe 80.00-85.00; No. 1 babbitt 55.00-57.00.

Aluminum: Clippings 2S 16.00-17.00; old sheets 13.00-14.00; crankcase 13.00-14.00; borings and turnings 12.00.

DAILY PRICE RECORD

1950	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Oct. 19	24.50	15.80	17.50	113.00	19.00	32.00	48.00	72.75
Oct. 17-18	24.50	15.80	17.50	112.50	19.00	32.00	48.00	72.75
Oct. 16	24.50	15.80	17.50	111.50	19.00	32.00	48.00	72.75
Oct. 13-14	24.50	15.80	17.50	111.375	19.00	32.00	48.00	72.75
Oct. 10-11	24.50	15.80	17.50	111.50	19.00	32.00	48.00	72.75
Oct. 9	24.50	15.80	17.50	109.25	19.00	32.00	48.00	72.75
Oct. 6-7	24.50	15.80	17.50	107.50	19.00	32.00	48.00	72.75
Oct. 4-5	24.50	15.80	17.50	106.00	19.00	32.00	48.00	72.75
Oct. 3	24.50	15.80	17.50	105.75	19.00	32.00	48.00	72.75
Oct. 2	24.50	15.80	17.50	104.00	17.50-19.00	32.00	48.00	72.75
Sept. Avg.	23.50	15.60	17.10	101.25	17.68	31.02	48.00	72.75
Sept. 28-30	22.50-24.50	15.80	17.50	102.50	17.50-19.00	32.00	48.00	72.75
Sept. 27	22.50-24.50	15.80	17.50	103.50	17.50-19.00	32.00	48.00	72.75
Sept. 25-26	22.50-24.50	15.80	17.50	104.00	17.50-19.00	32.00	48.00	72.75

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Aluminum primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

IRON AND STEEL SCRAP

Consumer prices, except as otherwise noted, including brokers' commissions, as reported to STEEL, Oct. 19, 1950; gross tons
Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

Oct. 19	$41.50
Oct. 12	41.00
Sept. 1950	40.93
Oct. 1949	26.71
Oct. 1945	19.17

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

No. 1 Heavy Melt.	$44.00
No. 2 Heavy Melt.	41.00
No. 1 Busheling	44.00
No. 1 Bundles	44.00-46.00
No. 2 Bundles	39.00
Heavy Turnings	43.00-44.00
Machine Shop Turnings	35.00-36.00†
Mixed Borings, Turnings	35.00-36.00†
Short Shovel Turnings.	38.00
Cast Iron Borings	36.00-37.00
Low Phos. Steel	*51.50-52.50*

Cast Iron Grades

No. 1 Cupola Cast	*49.00-50.00*
No. 1 Machinery Cast	*55.00-56.00*
Charging Box Cast	45.00-46.00
Heavy Breakable Cast.	44.00-45.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	44.00
Rails, Random Lengths	*59.00-60.00*
Rails, 2 ft. and under	*66.50-67.50*
Rails, 18 in. and under	*67.50-68.50*
Railroad Specialties	*59.00-59.50*

† Crushers' buying prices.

CLEVELAND

(Delivered Consuming Plant)

No. 1 Heavy Melt. Steel	$43.00-43.50
No. 2 Heavy Melt. Steel	39.00-39.50
No. 1 Busheling	42.50-43.00
No. 1 Bundles	42.50-43.00
No. 2 Bundles	31.00-31.50
Machine Shop Turnings	35.00-35.50
Mixed Borings, Turnings	36.50-37.00
Short Shovel Turnings.	36.50-37.00
Cast Iron Borings	36.50-37.00
Low Phos.	46.00-46.50

Cast Iron Grades

No. 1 Cupola	62.00-63.00
Charging Box Cast	49.00-50.00
Stove Plate	46.00-47.00
Heavy Breakable Cast.	49.00-50.00
Unstripped Motor Blocks	39.00-40.00
Brake Shoes	46.00-47.00
Clean Auto Cast	62.00-63.00
No. 1 Wheels	52.00-53.00
Burnt Cast	43.00-44.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	44.00
R.R. Malleable	64.00-65.00
Rails, 3 ft and under.	64.00-65.00
Rails, 18 in. and under	65.00-66.00
Rails, Random Lengths	60.00-61.00
Cast Steel	51.00-52.00
Railroad Specialties	53.00-54.00
Uncut Tires	58.00-59.00
Angles, Splice Bars	61.00-62.00

VALLEY

No. 1 Heavy Melt. Steel	$43.50-44.00
No. 2 Heavy Melt. Steel	39.50-40.00
No. 1 Bundles	43.50-44.00
Facty. Prod. Bundles.	43.50-44.00
No. 2 Bundles	34.00-34.50
Machine Shop Turnings	35.00-35.50
Short Shovel Turnings.	37.00-37.50
Cast Iron Borings	37.00-37.50
Low Phos.	46.00-46.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	43.50-44.00

PHILADELPHIA

No. 1 Heavy Melt. Steel	*$39.00-42.00*
No. 2 Heavy Melt. Steel	36.00
No. 1 Busheling	38.00
No. 1 Bundles	*39.00-42.00*
No. 2 Bundles	32.00
Short Shovel Turnings.	33.00
Machine Shop Turnings	28.50-29.00
Mixed Borings, Turnings	26.00-27.00
Low Phos. Punchings and Plate, elec. fur. grade	*48.00*
Low Phos. Plate, 5 ft & Under	*48.00*
Elec. Furnace Bundles	*44.00-45.00*
Heavy Turnings	39.00
No. 1 Chemical Borings	40.00
Knuckles and couplers	*50.00*
Steel car wheels	*50.00*

Cast Iron Grades

No. 1 Cupola Cast	48.00-49.00
No. 1 Machinery Cast.	50.00-51.00
No. 1 Yard Cast	*45.00-47.00*
Charging Box Cast	*48.00*
Heavy Breakable Cast	*48.00*
No. 1 Wheels	*56.00-57.00*
Malleable	*64.00*

CINCINNATI

No. 1 Heavy Melt. Steel	$42.00
No. 2 Heavy Melt. Steel	37.00
No. 1 Busheling	42.00
No. 1 Bundles	42.00
No. 1 Black Bundles	37.00
No. 3 Bundles	28.00
Machine Shop Turnings	27.00
Short Shovel Turnings.	30.00
Mixed Borings, Turnings	29.00
Cast Iron Borings	30.00

Cast Iron Grades

No. 1 Cupola Cast	*62.00*
Charging Box Cast	*53.00*
Stove Plate	*44.00*
Heavy Breakable Cast	*50.00*
Unstripped Motor Blocks	*38.00*
Brake Shoes	*34.00*
Clean Auto Cast	*60.00*
Drop Broken Cast	*65.00*
Low Phos., 18 in. and under	55.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	43.00
R.R. Malleable	*60.00*
Rails, Rerolling	*60.00*
Rails, Random Lengths	*60.00*
Rails, 18 in. and under	*70.00*

DETROIT

(Brokers' buying prices, f.o.b. shipping point)

No. 2 Heavy Melt. Steel	$30.00-31.00
No. 1 Bundles	37.00-37.50
No. 2 Bundles	29.00-30.00
No. 1 Busheling	37.00-37.50
Machine Shop Turnings	25.00-25.50
Forge Flashings	37.00-37.50
Short Shovel Turnings	27.00-27.50
Cast Iron Borings	27.00-27.50
Punchings & Plate Scrap	39.00-40.00

Cast Iron Grades

No. 1 Cupola Cast	*45.00-50.00*
Heavy Breakable Cast	*35.00-40.00*
Clean Auto Cast	*47.00-52.00*

BUFFALO

No. 1 Heavy Melt. Steel	$41.00-42.00
No. 2 Heavy Melt. Steel	38.00-38.50
No. 1 Busheling	38.00-38.50
No. 1 Bundles	39.50-40.00
No. 2 Bundles	36.00-36.50
Machine Shop Turnings	31.50-32.00
Mixed Borings, Turnings	31.50-32.00
Cast Iron Borings	31.50-32.00
Short Shovelings	33.50-34.00
Low Phos.	*47.00-48.00*

Cast Iron Grades

No. 1 Cupola	*44.00-45.00*
No. 1 Machinery	*51.00-52.00*
Malleable	*57.00-58.00*

Railroad Scrap

Rails, 2 ft. and under	*55.00-56.00*
Rials, random size	*52.00-53.00*
Railroad Specialties	*51.00-52.00*

NEW YORK

(Brokers' buying prices f.o.b. shipping point)

No. 1 Heavy Melt. Steel	$34.50
No. 2 Heavy Melt. Steel	29.00-30.00
No. 1 Busheling	32.00-33.00
No. 1 Bundles	34.50
No. 2 Bundles	*28.00-29.00*
Mixed Borings, Turnings	24.50-25.00
Machine Shop Turnings	24.50-25.00
Short Shovel Turnings	*26.00-27.00*
Punchings & Plate Scrap	*37.00-38.00*
Low Phos. Plate, 5 ft & under	*37.00-38.00*
Elec. Furnace Bundles.	36.00-37.00

Cast Iron Grades

No. 1 Cupola Cast	*39.00-40.00*
No. 1 Machinery	*41.00-42.00*
Charging Box Cast	*38.00-39.00*
Heavy Breakable	*38.00-39.00*
Unstripped Motor Blocks	*33.00-34.00*

BOSTON

(F.o.b. shipping point)

No. 1 Heavy Melt. Steel	$32.00
No. 2 Heavy Melt. Steel	28.50-29.00
No. 1 Bundles	32.00
No. 1 Busheling	31.50-32.00
Machine Shop Turnings	23.50-24.50
Short Shovel Turnings.	25.00-26.00
Mixed Borings, Turnings	25.00-25.50
Bar Crops and Plate	40.00-42.00
Punchings & Plate Scrap	40.00-42.00
Chemical Borings	29.00-30.00

Cast Iron Grades

No. 1 Cupola Cast	*40.00-41.00*
Mixed Cast	*37.00-38.00*
Heavy Breakable Cast	*36.00-37.00*
Stove Plate	*35.00-36.00*

CHICAGO

No. 1 Heavy Melt. Steel	$40.00
No. 2 Heavy Melt. Steel	38.00
No. 1 Bundles	40.00
No. 2 Bundles	35.00
Machine Shop Turnings.	31.00-32.00
Mixed Borings, Turnings	33.00-34.00
Short Shovel Turnings.	33.00-34.00
Cast Iron Borings	33.00-34.00
Low Phos.	*47.00-49.00*
Elec. Furnace Bundles.	40.00-41.00
Heavy Turnings	37.00-38.00
Cut Structurals	44.00-45.00

Cast Iron Grades

No. 1 Cupola Cast	53.00-54.00
Clean Auto Cast	54.00-56.00
No. 1 Wheels	*49.00-50.00*
Stove Plate	43.50-44.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	45.00-46.00
Malleable	59.00-60.00
Rails, Rerolling	64.00-65.00
Rails, Random Lengths.	56.00-57.00
Rails, 2 ft. and under.	61.00-62.00
Rails, 18 in. and under	62.00-63.00
Railroad Specialties	54.00-55.00
Angles, Splice Bars	53.00-54.00

BIRMINGHAM

No. 1 Heavy Melt. Steel	$38.00-40.00
No. 2 Heavy Melt. Steel	34.00-35.00
No. 1 Busheling	36.00
No. 2 Bundles	35.50
Machine Shop Turnings	30.00
Mixed Borings, Turnings	28.00
Short Shovel Turnings	34.00
Cast Iron Borings	28.00
Bar Crops and Plate	44.00-45.00
Cut Structurals	44.00

Cast Iron Grades

No. 1 Cupola Cast	54.00
Stove Plate	47.00-48.00
No. 1 Wheels	nominal

Railroad Scrap

No. 1 R.R. Heavy Melt.	40.00-41.00
R.R. Malleable	nominal
Rails, Rerolling	*58.00-59.00*
Rails, 2 ft and under	*59.00-60.00*
Angles and Splice Bars	50.00

ST. LOUIS

No. 1 Heavy Melt. Steel	*$40.00-41.00*
No. 2 Heavy Melt. Steel	36.00-37.00
No. 1 Bundles	39.00-40.00
No. 2 Bundles	35.00-36.00
Machine Shop Turnings	27.00-28.00
Short Shovel Turnings.	30.00-31.00

Cast Iron Grades

No. 1 Cupola Cast	*50.00-52.00*
Charging Box Cast	*40.00-42.00*
Heavy Breakable Cast	*42.00-44.00*
Brake Shoes	*47.00-49.00*
Clean Auto Cast	*50.00-52.00*
Burnt Cast	*41.00-43.00*

Railroad Scrap

R.R. Malleable	*58.00-60.00*
Rails, Rerolling	*61.00-63.00*
Rails, Random Lengths	*53.00-55.00*
Rails, 2 ft and under	*58.00-60.00*
Uncut Tires	*48.00-50.00*
Angles, Splice Bars	*56.00-58.00*
Railroad Specialties	*52.00-53.00*

SAN FRANCISCO

No. 1 Heavy Melt. Steel	$26.50
No. 2 Heavy Melt. Steel	24.50
No. 1 Bundles	26.50
No. 2 Bundles	22.50
No. 3 Bundles	19.50
Machine Shop Turnings	13.00
Low phos, electric	40.00

Cast Iron Grades

No. 1 Cupola Cast	45.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	26.50
Rails, Random Lengths	26.50

SEATTLE

No. 1 Heavy Melt. Steel	$24.00
No. 2 Heavy Melt. Steel	24.00
No. 1 Busheling	21.50
Nos. 1 & 2 Bundles	22.00
No. 3 Bundles	18.00
Machine Shop Turnings	15.00
Mixed Borings, Turnings	15.00
Punchings & Plate Scrap	30.00-32.50
Cut Structurals	30.00-32.50

Cast Iron Grades

No. 1 Cupola Cast	35.00-41.00
Heavy Breakable Cast	30.00-35.00
Stove Plate	25.00-27.50
Unstripped Motor Blocks	30.00
Malleable	30.00
Brake Shoes	30.00
Clean Auto Cast	35.00
No. 1 Wheels	32.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	25.00
Railroad Malleable	30.00
Rails, Random Lengths	26.00
Angles and Splice Bars	25.00

LOS ANGELES

(F.o.b. car, Los Angeles)

No. 1 Heavy Melt. Steel	$26.50
No. 2 Heavy Melt. Steel	24.50
No. 1 Bundles	26.50
No. 2 Bundles	22.50
No. 3 Bundles	17.50
Machine Shop Turnings	*13.00*
Punchings & Plate Scrap	*40.00*

Cast Iron Grades

No. 1 Cupola Cast	*49.00*

Railroad Scrap

No. 1 R.R. Heavy Melt.	*nominal*
Rails, Rerolling	39.50

HAMILTON, ONT.

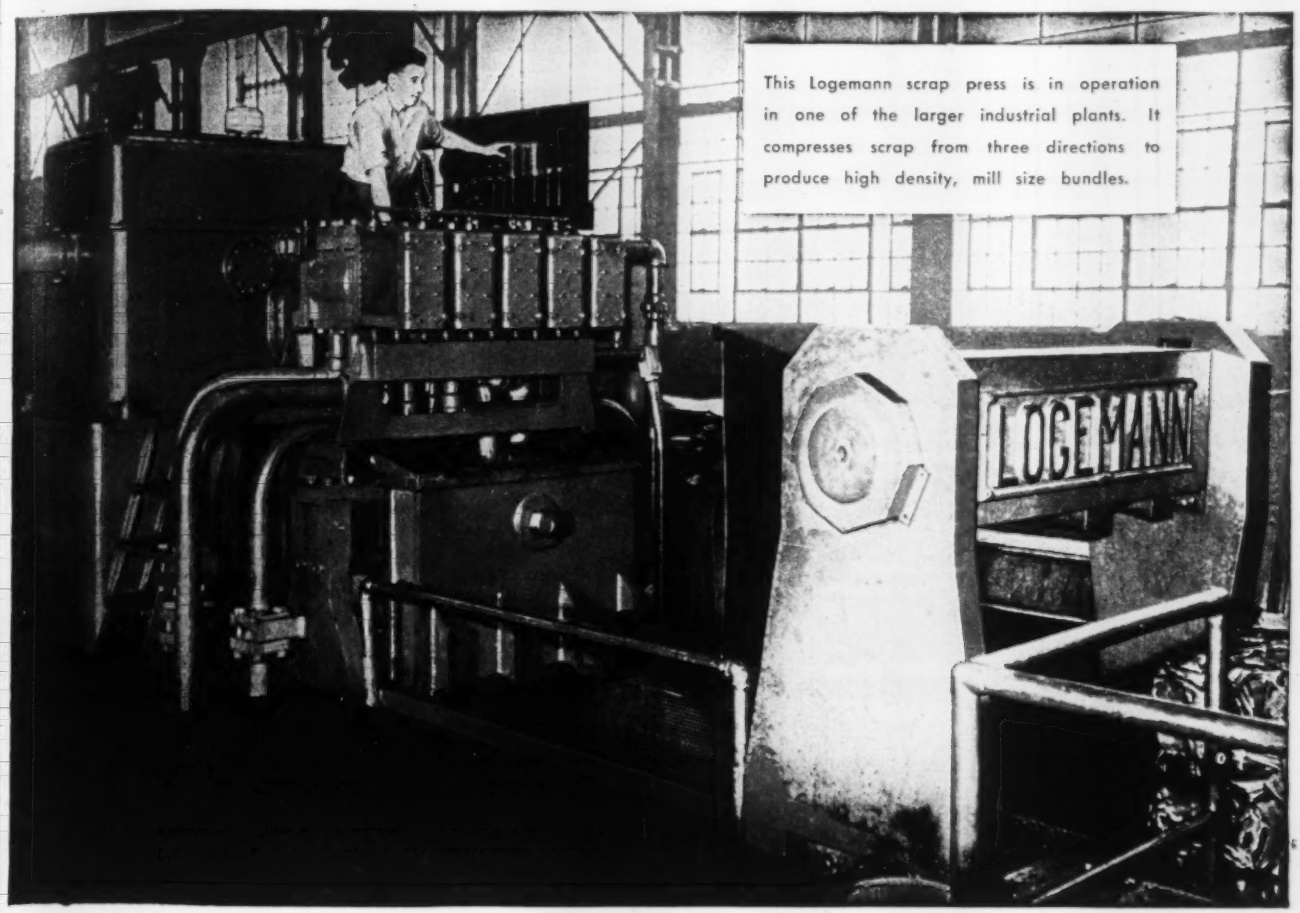
(Delivered prices)

Heavy Melt.	$30.00
No. 1 Bundles	30.00
Mechanical Bundles	28.00
Mixed Steel Scrap	28.00
Mixed Borings, Turnings	23.00
Rails, Remelting	30.00
Rails, Rerolling	33.00
Busheling	24.50
Bushelings new factory, prep'd	28.00
Bushelings new factory, unprep'd	23.00
Short Steel Turnings	23.00

Cast Iron Grades*

No. 1 Machinery Cast.	45.00

* F.o.b. shipping point.



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Sheets, Strip . . .

Sheet and Strip Prices, Page 105 & 106

New York—There has been a sharp spurt in DO priorities, although the majority of them are certifications of emergency orders already on mill books. Meanwhile, the setting up of 45 days lead time will make it possible for producers to enter a fair tonnage for December rolling, but will prove inadequate on some of the specially processed grades such as electrical sheets. Producers so far have not opened books for first quarter on any major carbon lines, although they have been accepting stainless sheets for first quarter on a selective basis. Some producers actually are accepting no more stainless business for that period, short of DO orders. Crucible Steel Co. of America increased cold alloy strip from 9.50c to 10.00c Harrison, N. J.

Philadelphia—Most sellers of stainless are no longer accepting orders unless convered by DO priority. This policy is ascribed to shortage of nickel. Chromium grades are offered as substitutes. Most DO orders on sheets arrived too late for handling in this quarter because of the 45 day lead time. However, where these priorities certify orders that have already been placed earlier for shipment this year they will, of course, be handled in the current quarter.

Boston—Books are open for January on silicon sheets with some producers. Rated DO volume is currently heavier than for civilian tonnage, although this comparison is fictitious due to inability of producers to accept additional non-rated orders.

Cleveland—Although first quarter books have not been opened the sheet and strip producers are so heavily booked for fourth quarter there will be large carryover into the new year. This is especially true with DO rated orders rising resulting in further delay in shipment of civilian tonnage. Increasingly, consumers are turning to the conversion and gray markets for relief in their supply difficulties, but even here they are meeting with little success. Conversion rolling time on mills doing this class of business is unavailable for months ahead, while gray market offerings not only carry extremely high prices, but the tonnage available is limited. The trend of prices is upward though no general advance is expected until the question of wages is settled by the large producers. Latest changes in this general producing area include increases of $7 to $12 per ton on various strip items by Greer Steel Co., Dover, O.

Pittsburgh — Nonintegrated mills are operating full 5 days per week, in some instances 6, depending on volume of hot-rolled material received from suppliers. Cold-rollers have turned down considerable tonnage for conversion because mills already are scheduled at near capacity for months ahead. Some cold-rollers have tentatively accepted considerable first quarter tonnage, but have not entered firm orders because of uncertain steel supply outlook from suppliers.

Upward price adjustments were effected by additional nonintegrated sheet and strip producers last week, including Superior Steel Corp., Carnegie, Pa., which advanced prices $5 to $12 a ton as follows: Hot-rolled carbon strip, to $3.75 per 100 pounds; hot-rolled alloy strip, $5.45; and cold-rolled alloy strip, $10.10. Company advanced cold-finished spring steel $7 per ton for carbon ranges produced. American Cladmetals Co., effective Oct. 10, advanced base prices on copper base steels, clad both sides with stainless, a range of 18 to 39 cents per pound, with exception of type 304 which was not revised.

Cincinnati—Sharp increase is noted in specifications for defense fabrication. Percentage of total tonnage for these demands for remainder of the year are not indicated, but the tightening supply for civilian needs will certainly mean early reduction of quotas as set up in previous quarters.

Kokomo, Ind.—Continental Steel Corp. has developed a new method of quoting galvanized sheets which takes into account additional manufacturing operations required in the company's mechanized hand mill. Galvanized sheets are now $4.80 No. 10 base gage for 18 gage and lighter and $5.30 base for 17 gage and heavier. Galvanized sheets are $5.35 10 gage base for 18 gage and lighter and $5.85 base for 17 gage and heavier. Copper alloy culvert sheets are now $5.80 16 gage base.

Chicago—Based on expectations of allocations to preference industries, notably freight car building, some mills are laying plans to reduce sheet, strip and tin plate output after first of the year. One mill has already inaugurated its own allocation program to freight car builders but has not changed product mix.

St. Louis—Consumers of cold-rolled sheets who do not have DO-rated orders face curtailed operations soon unless government gives local steel mills more allocations leeway. Metalworking industry here is a widely diversified assortment of comparatively small plants, while sheetmaking capacity here is small.

Steel Bars . . .

Bar Prices, Page 105

Cleveland—Steady increase in orders carrying DO ratings is indicated as fourth quarter advances with resulting tightening of supplies available for civilian goods account. Bulk of bar tonnage, however, still is being directed into civilian channels. Producers are booked so heavily for fourth quarter a large overflow tonnage into first quarter is indicated. Books have not yet been opened for the latter period. The tone of the market is strong and some talk is heard of a likely price advance soon. Copperweld Steel Co. has been quoting hot-rolled alloy bars $5 per ton higher, at 4.20c, mill, since the opening of October.

Boston—Incoming rated orders are heaviest in bars and flat-rolled. Backlogs of alloys are growing and shortages in hot-rolled, hampers cold finishing.

New York — Only consumers equipped with DO orders are able to pick up hot carbon bars from the mills. Producers generally are booked up over remainder of the year. Books have not been opened for first quarter. Consumers are having difficulty getting shipments due against back orders.

Pittsburgh — Bar demand exceeds output. Clarification of lead time and maximum tonnage limitations on DO rated orders have enabled alloy and carbon bar sellers to more accurately plan schedules.

Chicago — Cutback in bar quotas will be necessary next quarter when emphasis in the product mix shifts to shapes and other heavy sections. No indications are yet available as to how severe curtailments will be. Cold finishers are up in the air as to where they stand, supplywise, next quarter.

Seattle—Volume of bar orders is slightly less than 30 days ago, but is still of sizable proportions.

Plates . . .

Plate Prices, Page 105

Philadelphia—An estimated 140,000 tons of plates per month will be required in the first quarter for freight car construction and maintenance and repair under the voluntary allocation system established for this program. Total steel requirements in the first quarter will average approximately 325,000 tons per month, of which 40 per cent will be for maintenance and repairs. DO priorities will take precedence should there be any conflict. A shipment of 5000 tons of German plates, ¼ in. is scheduled to arrive this week.

New York—Plate sellers report an increasing number of DO priority orders. Much of this tonnage probably will be worked in during December. Total volume of this work to date is still relatively small, compared with capacity.

Pittsburgh—Upping of freight car program to 11,000 cars monthly starting in January will further restrict plates available for non-essential uses. It is now estimated about 282,000 tons of plates will be diverted monthly for freight car construction and repairs.

Chicago—Boost in plate production is planned locally at the expense of sheet and strip output. One district mill recently had 4000 tons of steel pile up for lack of transport and other mills on occasion have had to change shipping instructions to avoid this situation.

Tin Plate . . .

Tin Plate Prices, Page 106

Pittsburgh—Tin plate output this year may establish a record of about 5 million tons, reflecting heavy demand for tin containers, notably for beer, fruit juices, coffee, oil, etc. Can beer, fruit juices, coffee, oil, etc.

Tubular Goods . . .

Tubular Goods Prices, Page 108

New York—Merchant pipe sellers continue on a month-to-month allocation basis on shipments to distributors. But most distributors could sell much more tonnage than they are receiving. On direct sales to consumers some producers are out of the market having sold all they can handle for remainder of this year.

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Structural Shapes . . .

Structural Shape Prices, Page 105

Boston—Delivery is a mounting factor in placing of fabricated structural steel contracts. Best promise was seven months on recent 325-ton project, while some bridge shops are extended nine months. Contracts include 1000 tons, wharf shed, Providence, R. I., while 5000 tons, approaches, East Boston expressway, closing Oct. 31, tops new inquiry.

New York—Structural fabricators report some easing in inquiry but there is still more than they can handle. They are heavily booked and shape allotments are shrinking. Increasingly substantial gaps are noted in plain material inventories.

Philadelphia—Blanking out of December and November by the leading eastern producer has added further to the stringency in shapes. District fabricating shops are having difficulty maintaining normal operation. Ban of construction of certain types of amusement facilities and probable curtailment of such building as stores, restaurants and churches is expected.

Cleveland — Structural fabricators are increasingly selective in booking business. Some who earlier in the year took on jobs at low bid prices now are complaining of the high costs which are making much work unprofitable. Bids are noticeably up since pre-Korea days and with costs continuing to rise indications are a large volume of projected construction will be deferred.

Seattle—Fabricators are severely handicapped by shortage of materials and protracted mill deliveries. Some plants are confining operations to small jobs involving tonnages which they have definitely available.

Wire . . .

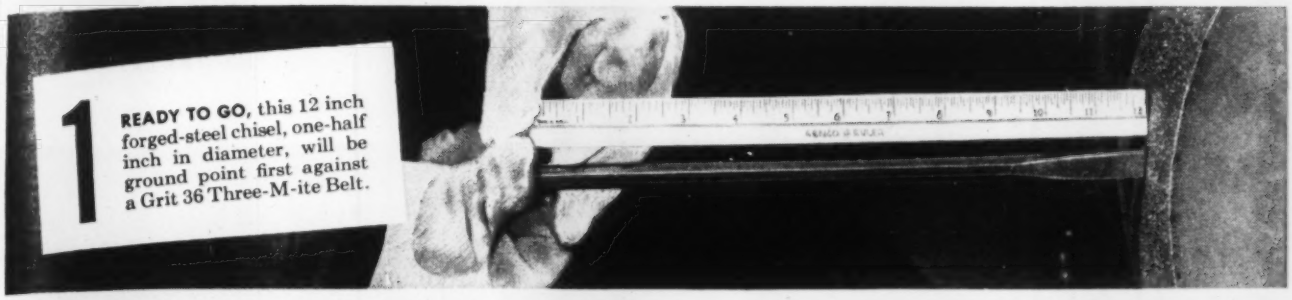
Wire Prices, Page 107

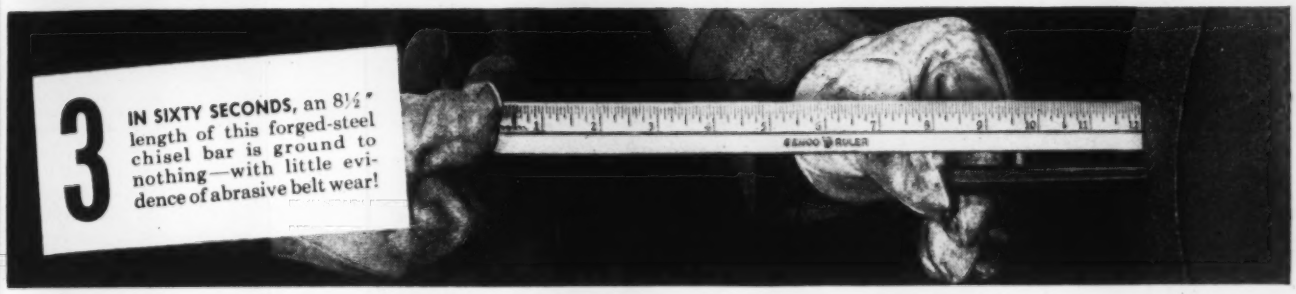
Peoria, Ill. — Keystone Steel & Wire Co. last week announced plans to increase annual steelmaking capacity 100,000 tons. A fourth open hearth of approximately 170-ton capacity will be constructed. Following this addition will be expansion, not yet detailed, in soaking pit, blooming mill and other departments.

The company advanced galvanized products $4 a ton on Oct. 18, bringing galvanized merchant quality wire to $5.80 and 16 gage galvanized stone wire to $11.50 per 100 pounds. Galvanized barbed wire was increased $2 a ton.

Sterling, Ill. — Effective Oct. 13, Northwestern Steel & Wire Co. advanced prices $5 to $7 a ton. New price for wire rods is 4.10c, manufacturers bright low carbon wire 4.80c, merchant quality wire annealed 5.65c, galvanized 6.15c, barbed wire col. 133, woven col. 123, bale ties col. 119, stock nails and staples col. 112, nonstock nails and staples 5.65c.

Kokomo, Ind.—Continental Steel Corp., effective Oct. 16, increased wire prices to the following levels: manufacturers bright low carbon 4.85c, merchant quality annealed 5.70c, galvanized 5.95c, barbed wire col. 135, woven fence col. 123, bale


1
READY TO GO, this 12 inch forged-steel chisel, one-half inch in diameter, will be ground point first against a Grit 36 Three-M-ite Belt.


3
IN SIXTY SECONDS, an 8½" length of this forged-steel chisel bar is ground to nothing—with little evidence of abrasive belt wear!

Only 3M Abrasive Belts give you grinding speed like this!

The 3M Abrasive Belt used in this dramatic test was driven at over 2 miles a minute, with complete safety. In just 60 seconds, a ½" diameter forged-steel chisel was ground from 12" long down to 3½"—total of 8½", with little evidence of abrasive belt wear.

What does this remarkable test mean to you? It means the 3M Method and 3M Abrasive Belts can cut your grinding time and abrasive cost. It means real abrasive stamina and quality—the kind you learn to expect when you specify 3M Abrasive Belts.

WE INVITE YOU TO USE OUR DEMONSTRATION ROOMS to work out faster and more economical grinding and finishing methods. A 3M Methods Engineer will show you how modern belt grinding equipment can cut costs. For the address of your nearest 3M Demonstration Room, write Dept. S-105.

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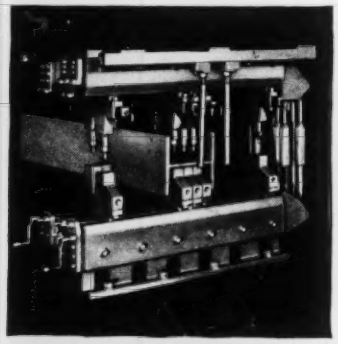

BEATTY Adjustable Tools punch webs of beams and channels, legs of angles and plates.

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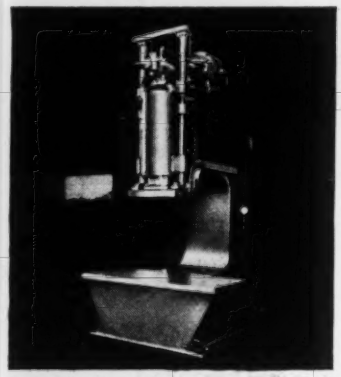

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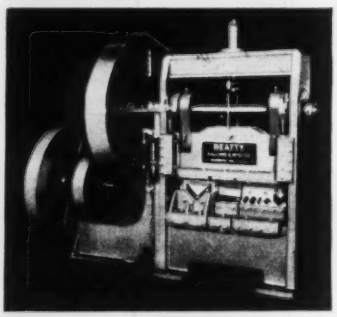
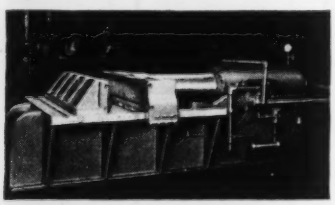


BEATTY Guillotine Bar Shear for "short order" shearing without changing tools.



BEATTY Horizontal Hydraulic Bull-dozer for heavy forming, flanging, bending.

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ties col. 120, stock nails and staples col. 112, nonstock nails and staples 5.65c. Galvanizing extra for nails was increased to 3.15c, coating extra now being based on zinc price fluctuations.

Cleveland—Wire suppliers are doing everything possible to keep pace with demand, but shipments are steadily falling behind and expectations are the mills will enter the new year with larger than normal carryover. Military and other emergency orders threaten to further delay shipments on civilian account though limitations on DO business under allocation regulations will permit the separate producers to continue to ship the bulk of their production into civilian channels. Recent price advances on certain galvanized wire products by several producers have not yet been uniformly applied. Last week the Seneca Wire & Mfg. Co., Fostoria, O., announced increases on weaving wire, annealed and galvanized 16 gage wire, rope wire, MB spring high carbon wire, and manufacturers' bright low carbon wire. The increases ranged from $3 to $20 per ton.

Pittsburgh — Heavy influx of inquiries, some bearing DO ratings, is reported by wire producers. It now appears rated orders carrying 45 days lead time will necessitate some disruption of schedules later this year and consequently prevent clearing up all carryover tonnage. Pittsburgh Steel Co., plans to begin production of oil tempered spring wire early next year.

Tool Steel . . .

Tool Steel Prices, Page 107

Pittsburgh — Demand far exceeds production schedules, resulting in record peacetime tool steel order backlogs. Where possible, output is being increased but availability of raw materials, notably tungsten, is a restricting influence. Advance in tool steel prices is thought inevitable.

Iron Ore . . .

Iron Ore Prices, Page 109

Cleveland—Decrease in Lake Superior iron ore shipments from United States ports so far this season compared with those for the like 1949 period has been reduced to only 3,770,475 tons compared with a deficit of over 12 million tons in mid-July.

Shipments from all ports in the week ended Oct. 16 totaled 2,548,213 tons compared with 2,667,042 tons for the preceding week and 191,466 for the like 1949 week. The cumulative total for the season to Oct. 16 is 64,505,869 tons against 68,111,514 tons for the like period a year ago.

Consumption of ore held steady on September at 7,174,745 tons compared with 7,371,365 tons in August. In September of last year, consumption totaled 5,564,671 tons. This brought total consumption for the first nine months to 61,971,360 tons compared with 59,805,792 tons in the like 1949 period. Stocks on hand increased to 35,715,773 gross tons on Oct. 1 from 29,965,663 tons on Sept. 1 and compared with 45,356,369 tons a year previously.

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A completely modern, integrated wire mill is now in operation at Bethlehem Pacific's Los Angeles plant. Steelmaking furnaces, high-speed rolling equipment, drawing blocks, and patenting and annealing furnaces are all coordinated at this plant to turn out high-quality wire in the range of grades and sizes that are called for by industries of the Southwest.

Consisting largely of bright, annealed, and spring grades, Bethlehem Pacific wire is used by manufacturers of an almost unlimited list of products that reach both consumer and industrial markets.

The completion of this mill marks another milestone in the enlargement and improvement program under way at the various Bethlehem Pacific plants. It is part of the company's long-range plan to supply more steel and steel products for this fast-expanding region.

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Steelmaking Plants: Los Angeles, South San Francisco, Seattle
Structural Fabricating Works: Los Angeles, South San Francisco, Alameda, Seattle
Bolt and Nut Plants: Los Angeles, South San Francisco, Seattle

BETHLEHEM STEEL

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In Business for Your Safety

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 108

Cleveland—There is no prospect for early relief in tight supply conditions in the foundry coke market. The casting shops have been forced to bring in coke from distant points to augment supplies available from producers normally serving this area.

Pig Iron . . .

Pig Iron Prices, Page 104

Boston—Foundry pig iron supply has tightened with Everett furnace now holding shipments to contract requirements. Melt is heavier, but part of demand reflects inclination of more consumers to build inventory. Foreign iron, offered at $57-58 dock, moves slowly. Foundry coke has advanced to $24.30 net ton f.o.b. Everett.

New York—A $3 per ton increase by the Bethlehem, Pa., producer has placed minimum delivered prices in Brooklyn at $55.79 for No. 2 iron and $56.29 for malleable. Minimum delivered prices at Newark, N. J., are up correspondingly to $53.63 for basic, $54.13 for No. 2 foundry, $54.63 for malleable and $55.13 for bessemer.

Philadelphia—An advance of $3 per ton at Bethlehem without any change so far at Swedeland, Pa., has placed minimum delivered prices here at $51,44 for basic, $51.94 for No. 2 foundry, $52.44 for malleable, and $52.94 for bessemer. These prices are predicated on the current Swedeland prices plus freight rate into Philadelphia of $1.44, not including the three per cent federal tax.

Buffalo—With pig iron shortage becoming more acute, many foundries are using more scrap in operations. Iron shipments to one melter were cut 25 per cent. Railroad casting shops call for increased tonnages.

Pittsburgh—Foundries serving railroads and the plumbing goods makers registered the most marked improvement in production since early this year. These foundries are on three shift operations where manpower and raw material supply permit. Pig iron supply is most critical among basic raw materials.

Cleveland—Merchant pig iron suppliers report demand is in excess of supply and that the stringency will likely worsen as military and other emergency requirements cut into available supplies. Soaring cast scrap prices reflect foundries' efforts to increase their scrap melt in lieu of pig iron. Production of pig iron in this area is being pushed to the limit of available stacks.

Cincinnati—Foundry order backlogs are increasing, with resultant pressure for more pig iron.

Chicago—Inland Steel Co., which on Oct. 13 increased its malleable and basic iron prices $3, last Monday began a malleable campaign at one furnace to replenish its stock for sale on allocation.

St. Louis—Blast furnace demand for pig iron is the highest in history, forcing Koppers Co. at Granite City, Ill., to cut back allotments to all customers.

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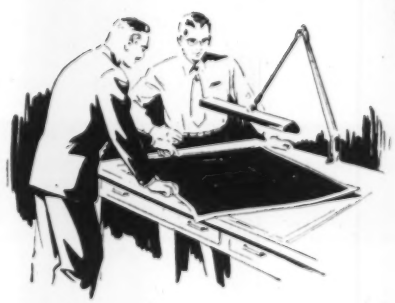
1¾% Chrome .60/.80 Moly
2% Chrome ½% Moly
2¼% Chrome .90/1.00% Moly
4/6% Chrome ½% Moly
6-8% Chrome ½% Moly
7-9% Chrome ½% Moly
SAE 1335
SAE 2300
SAE 2512
SAE 4130; SAE 4140
SAE 4615
SAE 8615, 8617 Fine Grain
SAE 8620; 8630; 8635; 8640
5% Ni.
9% Ni.

TYPICAL APPLICATIONS:

Superheat Tubes
Pressure Tubes
Still Tubes
Mechanical Tubes
Condenser Tubes
Barrel Tubes
Pump Barrels — Oil Well
Evaporator Tubes
Aircraft Tubes
Propellers
Rollers for Transmission Chains
Oil Well Tubing

GLOBE TUBES



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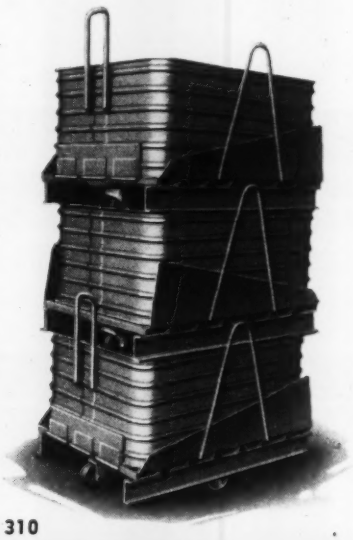

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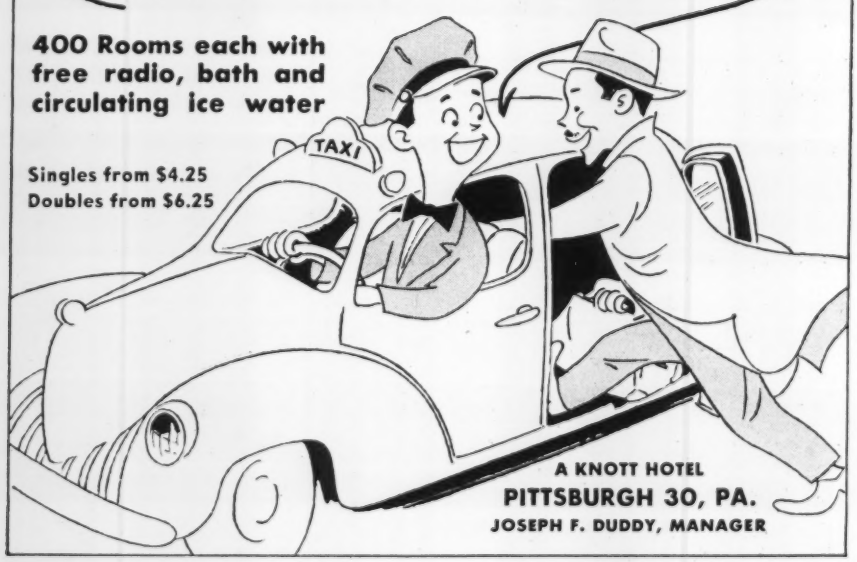

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JOSEPH F. DUDDY, MANAGER

Scrap . . .

Scrap Prices, Page 112

Philadelphia—Formula price on No. 1 heavy melting and No. 1 bundles is being subjected to greater strain. Certain buyers, especially the converters, are buying more scrap of standard grade at higher levels. They are paying as high as $42, delivered, on this material and even higher for special specifications. Meanwhile, those who are sticking to the $39 delivered formula level are having much greater difficulty getting material. Some brokers now claim they are unable to obtain any yard scrap for handling at that level. The market is higher at $39-$42, delivered, for No. 1 heavy and No. 1 bundles. No. 2 heavy melting, No. 1 busheling, and No. 2 bundles, and turnings are unchanged.

Low phos grades are higher at $48.00 with the undertone strong. Electric furnace bundles are higher at $44-$45 and knucklers and couplers and steel car wheels at $50.

In the cast grades No. 1 yard cast is stronger at $45-$47 and heavy breakable and charging box at $48. No. 1 wheels jumped to $56-$57 and malleable to $64. Both of these latter grades are very difficult to obtain even at these new levels.

Buffalo—Limited business is reported above the voluntary ceilings in the scrap market. The leading consumer continues to adhere to the formula setup, but some dealers are paying above these levels to get No. 1 heavy melting.

New York—Brokers have advanced buying prices on No. 2 bundles to $28-$29 f.o.b. shipping point, short shovel turnings to $26-$27, punchings and plate scrap and low phos plate five feet and under to $37-$38. Brokers also have advanced prices sharply for cast scrap. They are now offering to buy No. 1 cupola at $39-$40.

Boston—Cast grades range up to $3 a ton higher with buying stronger. Some tightening in pig iron, plus inventory expansion, gives strength to all cast scrap. Steelmaking grades are steady.

Pittsburgh—Formula prices for open hearth grades are maintained, but marked strength in low phos, cast grades and railroad rails was evidenced last week on sales about $2 above previous quotations. At least one large foundry purchased No. 1 machinery cast at $56 and 2-foot rails at $67.50 last week.

Detroit—With no protective price formula, cast scrap is running wild and most dealers are piling material, holding out for still higher prices. A few weeks ago, No. 1 cupola was quoted at $43, now it has jumped to $45-$50, and there have been offers to sell tonnage at $70. Heavy breakable brings at least $35-$40, and clean auto cast at least $2 more than No. 1 cupola.

Cleveland—Undertone of the scrap market continues strong. Some interests believe the formula will give way early next month under pressure of heavy mill demand to sustain current record operations and to accumulate reserves for winter months. Higher prices may be necessary to stimulate the movement of scrap, including those tonnages now being withheld in yards. Substantial ton-

nages are moving on old orders. Cast iron and railroad scrap are commanding especially high prices.

Cincinnati — Formula prices are holding on steelmaking scrap, but foundry grades are as much as $5 higher. No. 1 railroad heavy melting steel is unchanged at $43; $70 for short rails, up $5, is a new high mark.

Chicago—What might be happening to open-hearth grades if mills were less cost conscious is well demonstrated in cast items. Cupola cast sales occurred last week in a range of at least $7, from $52 to $59. With all available pig iron being used, further increases in demand for castings will undoubtedly be reflected in greater pressure for scrap. A few foundries, however, have already found proper grades of scrap unobtainable or excessively costly or have reached the maximum scrap usage level. When this condition becomes more general, a leveling off in prices seems inevitable. The whole scrap market was hectic last week and special deals were rampant. Particularly obscure is the market for low phos grades. Bulk of dealer tonnage, however, is moving in a $47 to $49 spread. Choice industrial material brings several dollars more.

St. Louis—Scrap prices are $1 to $4 higher under scarcity pressure. Brake shoes were marked up $4 as supply was tightened by the railroads' rolling stock expansion program.

Warehouse . . .

Warehouse Prices, Page 109

Philadelphia — District warehouses report fair number of DO orders, which they are covering where material is in stock and in quantities which fall within the usual warehouse pattern. Stocks, however, are becoming increasingly short and distributors believe sales this month may fail to expand for this reason for the first time in several months.

Pittsburgh—Distributors are awaiting a decision on how to replace tonnage shipped from stock in filling DO rated orders. Distributors' inventories tend downward despite careful screening in order acceptance. Warehouse quotations are unchanged.

Cleveland—Warehouse stocks are being rapidly depleted in all categories. Some distributors are in better inventory position than others because they had built up stocks in the months prior to the outbreak of the Korean war in June. But even these sellers are having difficulty meeting customers' demands with shipments from the mills not keeping pace with outgrowing warehouse tonnage.

Cincinnati—Few warehouse items are in adequate supply as inventories get farther out of balance. Against booming demand along the whole list, mill deliveries to distributors are frequently tardy or less than hoped-for tonnage. Sales volume, because of scarcity of steel, continues below September levels.

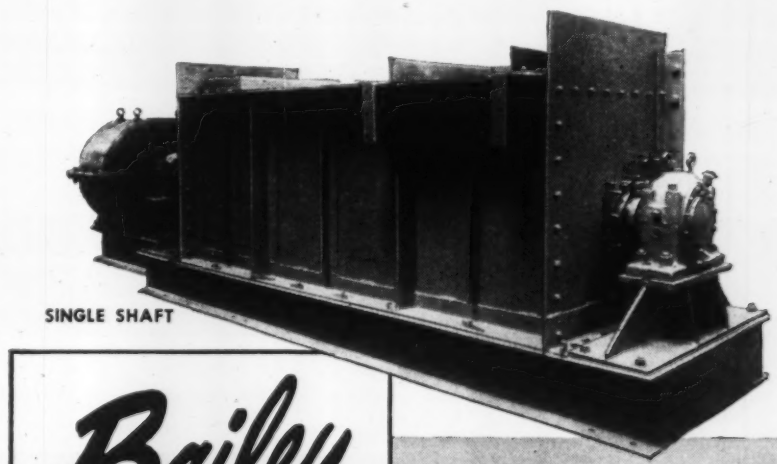
Chicago — Methods used by warehouses to allocate steel to customers vary. Some limit the amount which can be received by any one customer. Others allocate material to salesmen for disposal on any basis they consider fair. Under this latter method some consumers are offered critical items on a tie-in basis, acceptance of a certain amount of specialties being a condition of sale of wanted items. Customers in such cases often use these specialties for trading purposes. An increase in foreign steel offerings is noted. Warehousemen report more customers are curtailing operations for lack of steel.

Birmingham—Warehouse prices on carbon plate rose $3 a ton. Shipments of steel by distributors are off somewhat because of inadequate stocks.

Los Angeles — District fabricators are being contacted by brokers of premium priced steel. Immediate delivery from stocks is promised. Prices quoted vary according to the transaction, small tonnages of cold-rolled sheets reportedly bringing 17.25 cents per pound.

San Francisco—Demand is heavier than ever, but distributors' turnover is trimmed by inability to obtain supplies. Inventories of sheets, light plates and structurals are virtually non-existent.

Seattle—Warehouses are making the best of a bad situation due to inability to replace stocks which are below normal and badly broken. Sheets and plates continue the most critical, while cold-finished bars also are extremely short.



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175	325	650	1200	1750
188	338	700	1250	1800
200	350	750	1300	1850
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Fasteners . . .

Bolt, Nut, Rivet Prices, Page 108

New York—Most eastern bolt and nut makers maintain a single shift, and could operate two and even three shifts were it not for the scarcity of steel and increasing manpower stringency. Demand is active. Many have been selling out of stock for some time past and inventories are the lowest in months.

Canada . . .

Toronto, Ont.—Production of steel ingots and pig iron in Canada for the first eight months this year topped all previous records. For August, pig iron production made a new monthly record for 1950 at 201,830 net tons compared with 194,016 tons in July and 180,115 tons in August, 1949. Production for the first eight months was 1,498,036 net tons against 1,490,567 tons in the like 1949 period.

Production of steel ingots and castings in August amounted to 281,312 net tons compared with 264,190 tons in July and 248,749 tons in August, 1949. Output for the first eight months totaled 2,234,526 net tons against 2,163,620 tons in the 1949 period.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

2500 tons, plant addition, Mack Trucks Inc., Plainfield, N. J., to Bethlehem Steel Co.

2060 tons, building 120, American Cyanamid Co., Pearl River, N. Y., to American Bridge Co., Pittsburgh.

1000 tons, transit shed, arch type roof, municipal wharf, Providence, R. I., to Bethlehem Steel Co.

690 tons, state highway bridge, Schuylkill county, Pennsylvania, to American Bridge Co., Pittsburgh.

660 tons, state bridge, Berks county, Pennsylvania, through G. A. and F. C. Wagman, Dallastown, Pa., to Bethlehem Steel Co.

600 tons, Phillip Morris tobacco warehouse, Richmond, Va., to Belmont Iron Works, Eddystone, Pa.

600 tons, Oregon state Willamette river bridge, Salem, to American Bridge Co., Portland.

500 tons, additions and alterations, central office, Bell Telephone Co., Ninth & Race Sts., Philadelphia, to Bethlehem Steel Co.

480 tons, warehouse and runway, Gulf Oil Co., Philadelphia, to Bethlehem Steel Co.

450 tons, factory building, Racine, Wis., to Worden-Allen Co., Milwaukee, Wis.

390 tons, Berks County Home and Hospital, Reading, Pa., to Reading Metalcraft Co., that city.

325 tons, alterations, Sullivan Square, Boston, Metropolitan Transit Authority, to Lehigh Structural Steel Co., Allentown, Pa.

300 tons, Oregon state 751-foot Jasper bridge, to Poole, McGonigle & Dick, Portland; Hamilton & Thomas, Eugene, general contract, $208,370.

100 tons, shapes, bars and H-piling, Pennamaquan bridge, Pembroke, Me., to Bancroft & Martin Rolling Mills Co., Portland, Me.; Forest Frederick, Pittsfield, Me., general contractor.

100 tons or more, digestion control building and miscellaneous structures, Nut Island sewage plant, Quincy, Mass., to Groisser & Shlager Iron Works, Boston; Rich Bros. Construction Co. Inc., Boston, general contractor; Truscon Steel Co., Boston, reinforcing steel.

100 tons or more, addition, Classical High School, Lynn, Mass., to Waghorne & Brown, Boston, (Bethlehem Fabricators Inc.); A. Cefalo & Sons Inc., Lynn, general contractor.

100 tons or more, junior high school, Somerset, Mass., to John E. Cox Co., Fall River, Mass.; Vara Construction Co., Boston, general contractor.

Unstated, high school, Upper Darby, Pa., to Lehigh Structural Steel Co., Allentown, Pa.

STRUCTURAL STEEL PENDING

7500 tons, No. 45AB, state turnpike bridge, Newark, N. J.; bids Oct. 31.

5000 tons, north and south extensions, East Boston expressway, Boston; bids Oct. 31, state Department of Public Works, Boston.

600 tons, gymnasium, Rhode Island State University, Kingston, R. I., pending.

557 tons, state bridge, Indiana county, Pennsylvania; bids Nov. 10.

555 tons, Trenton approaches to bridge, Delaware River Joint Toll Bridge Commission; bids Nov. 9.

475 tons, Pennsylvania railroad bridge, Monmouth Junction, N. J.; bids Oct. 26.

450 tons, agricultural building, University of Delaware, Newark, Del.; bids Oct. 27.

450 tons, 800-foot joint Idaho-Oregon Snake river bridge; bids to Boise, Oct. 27.

430 tons, state hospital building, Hollidaysburg, Pa.; McCloskey & Co., Philadelphia, low on general contract.

400 tons, state hospital building, Somerset, Pa.; bids Oct. 20.

360 tons, state bridge, Camden county, N. J.; general contract awarded to Francis A. Canuso & Son, Camden, N. J.

200 tons, building Du Pont company, Salem county, New Jersey; bids Oct. 18.

200 tons, St. Bartholomew school, Providence, R. I.

150 tons, state laundry and service building, Middletown, Conn.

180 tons, Princeton, N. J., hospital addition; Matthews Construction Co., Princeton, low on general contract.

110 tons, Bell Telephone exchange, Camden, N. J.; Thomas Pagan, that city, low on general contract.

110 tons, also 15 tons reinforcing, highway bridge, Curry county, Oregon; bids to Bureau of Public Roads, Portland, Oct. 19.

105 tons, 54-foot rolled I-beam bridge, harbor front relocation U. S. route 1, New Haven, Conn.; bids in; project also takes 75 tons reinforcing bars.

100 tons, Little River bridge, Gorham, Me.; bids Oct. 18, Augusta, Me.

100 tons, shapes and bars, state bridge, Indian river, Milford, Conn.; bids in.

100 tons, including reinforcing, Washington state Ferry county bridge; bids to Olympia, Oct. 24.

Unstated, 363 towers and 1204 grillages, transmission line; bids to Bonneville Power Administration, Portland, Oreg., Oct. 19.

Unstated, substation steel items; bids to Bonneville Power Administration, Portland, Oreg., Oct. 16.

Unstated, Whatcom county, Washington, steel girder span; C. B. Croy, Bellingham, Wash., low, $51,975.

Unstated, two warehouses, Ft. Richardson, Alaska; bids to U. S. Engineer, Anchorage, Nov. 2.

Unstated, four steel substations for Atomic Energy Commission, Idaho Falls, Idaho; general award to Fonnesbeck Electric Co., Idaho Falls, low $313,522; also generating plant for AEC, Paul W. Larsen, Salt Lake City, low $362,589.

Unstated, pulp plant expansions, Springfield, Oreg., and Longview, Wash., for Weyerhaeuser Timber Co., Longview; general contract to L. H. Hoffman Co., Portland, Oreg.

Unstated, Canyon Ferry power plant; bids soon to Bureau of Reclamation, Denver; bids for same project opened Sept. 21, rejected.

Unstated, two radial gate hoists for Potholes East canal, Columbia Basin project; bids to Denver Nov. 7.

REINFORCING BARS . . .

REINFORCING BARS PLACED

150 tons, parking garage, Eglin Parking Garage Co., Philadelphia, to American Engineering Co., that city.

140 tons, National Bank of Washington, Tacoma, and Northgate theater, Seattle, to Pacific Car & Foundry Co., Seattle.

115 tons, state highway bridges, Derby-Ansonia, Conn., to Truscon Steel Co., New York; Mariani Construction Co., New Haven, general contractor.

110 tons, state hospital, Torrance, Pa., to Bethlehem Steel Co.

100 tons, addition, Classical High School, Lynn, Mass., to United States Steel Supply Co., Boston; A. Cefalo & Sons Inc., Lynn, general contractor.

Unstated, nine steel buildings, also tanks, etc., expansion of Kaiser Aluminum & Chemical Corp.'s Mead reduction plant, Spokane, Wash., to Kaiser Engineers Inc.

REINFORCING BARS PENDING

623 tons, bridge approaches, Delaware River Joint Toll Commission, Trenton, N. J.; 450 tons will be for the Morrisville, Pa., approaches, bids Nov. 2, and 373 tons for the Trenton approaches, bids Nov. 9.

400 tons, Caspar Sharples public school, Seattle; Postem & Co., Seattle, low.

160 tons, outside facilities Eielson air base, Alaska; bids to U. S. Engineer, Anchorage, Alaska, Nov. 15.

160 tons, Firestone Tire & Rubber Co., Des Moines, Iowa; bids asked.

115 tons, Our Lady of Mercy Mission, Chicago; bids asked.

100 tons, Goss Printing Co., Cicero, Ill.; bids asked.

100 tons, Washington state highway projects; bids to Olympia Oct. 24.

100 tons, sewage treatment plant, Olympia, Wash.; A. G. Homann, Lacey, low, $356,978.

100 tons, Washington state highway bridge; C. V. Wilder, Bellingham, low, $79,535.

Unstated, 710-foot bridge, Yakima river, Washington; bids to Atomic Energy Commission, Richland, Wash., Oct. 30.

Unstated, division headquarters, Seattle light department; bids Oct. 18.

Unstated, shop and two storage buildings, for Anchorage, Alaska; J. B. Warrack Construction Co., Seattle, low $320,000.

PLATES . . .

PLATES PLACED

330 tons, tanks, Port of New York Authority, New York City, Chicago Bridge & Iron Works, Chicago.

200 tons, Washington state Cowlitz river bridge, to Bethlehem Pacific Coast Steel Corp., Seattle; 300 tons additional for same project to unnamed interests.

PLATES PENDING

500 tons or more, 1350-foot penstock Cushman power house; bids to Tacoma, Wash., Oct. 23.

305 tons, structural plate, Air Materiel Command, Dayton, O.; bids in.

100 tons, tank installations at Seattle; bids soon to The Texas Co., New York.

Unstated, tank installations for Atomic Energy Commission, Richland, Wash.; bids soon.

Unstated, pulp mill expansions for Weyerhaeuser Timber Co., Longview, Wash.; L. H. Hoffman Co., Portland, general contractor.

PIPE . . .

CAST IRON PIPE PENDING

2500 tons, 31,000 feet of 20 inch, for Ship Creek dam and power project, Alaska; of which about 155 tons will be purchased on bids, balance furnished by government; bids to U. S. Engineer, Anchorage, Alaska, Oct. 19.

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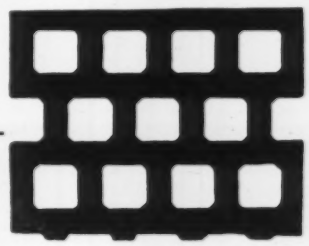

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RAILS, CARS . . .

LOCOMOTIVES PLACED

Canadian National Railways, eighteen 1000-horsepower diesel-electric road switching units to the Canadian Locomotive Co., Montreal.

New York Central, 200 diesel-electric locomotives: thirty-four 1500-hp, freight units, four 2250-hp passenger units, fifty 1500-hp road switchers and twenty 1200-hp yard switchers, to Electro-Motive Division, General Motors Corp., La Grange, Ill.; twelve 1600 hp freight units and fifty 1600-hp road switchers, to American Locomotive-General Electric Companies, Schenectady, N. Y.; thirteen 1600-hp road switchers, to Fairbanks, Morse & Co., Chicago; seventeen 1200-hp road switchers, to Lima-Hamilton Corp., Lima, O.

LOCOMOTIVES PENDING

Long Island Railroad, 12 diesel-electric locomotive passenger units; court permission to purchase sought; units comprise four 2400-hp engines, six 1600-hp engines with multiple units enclosed and two 1600-hp units; low bid received from Fairbanks, Morse & Co., Chicago.

RAILROAD CARS PLACED

Metropolitan Transit Authority, Boston, 90 trolley coaches, to Pullman-Standard Car Mfg. Co.'s Worcester, Mass., plant.

Minneapolis, St. Paul & Sault Ste. Marie, 150 fifty-ton box cars to its own shops; these are in addition to 250 fifty-ton box cars awarded to its own shops recently.

Missouri Pacific, 500 seventy-ton gondolas to its DeSoto, Mo., shops.

New York Central, 5500 freight cars plus 1500 for its affiliated road, Pittsburgh & Lake Erie; 1000 hopper cars each to American Car & Foundry Co., New York, Pullman-Standard Car Mfg. Co., Chicago, and General American Transportation Corp., Chicago; 2500 box cars to Despatch Shops Inc., East Rochester, N. Y.; 500 gondolas to Greenville Steel Car Co., Greenville, Pa., 1000 gondolas to Bethlehem Steel Co.

RAILROAD CARS PENDING

Baltimore & Ohio, 2000 fifty-ton hopper cars; pending.

Minneapolis & St. Louis, 700 fifty-ton box cars and 100 flat cars; purchase authorized.

RAILS PLACED

Chesapeake & Ohio, 25,424 gross tons to Carnegie-Illinois Steel Corp., Pittsburgh; 20,011 tons to Inland Steel Co., Chicago; 6350 tons to Bethlehem Steel Co.

FERROALLOYS

(*Continued from page 109*)

Foundry Ferrochrome: (Cr 62-66%, C 5-7%). Contract, c.l., 8 MxD, bulk, 22.0c per lb of contained Cr, c.l., packed 22.9c, ton 24.25c, less ton 26.0c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, max. 0.03% C 31.85c per lb of contained Cr, 0.04% C 29.75c, 0.06% C 28.75c, 0.10% C 28.25c-28.5c, 0.15% C 28.0c, 0.20% C 27.75c, 0.50% C 27.5c, 1% C 27.25c, 1.50% C 27.1c, 2% C 27.0c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

"SM" Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%, Mn 4-6%, C 0.75-1.25% max.). Contract, carload, lump, bulk 27.75c per lb of contained chromium, carload, packed 28.85c, ton lots 30.05c, less ton 31.85c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 5c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 5c for each 0.25% of N above 0.75%.

Low-Carbon Ferrochrome Silicon: (Cr 34.41%, Si 42-49%, C 0.05% max.) Contract, carload, lump, 4" x down and 2" x down, bulk, 20.50c per lb of contained chromium plus 11.30c per pound of contained silicon; 1" x down, bulk 20.65c per pound of contained chromium plus 11.50c per pound of contained silicon, F.o.b. plant; freight allowed to destination.

Chromium Metal: (Min. 97% Cr and 1% Fe). Contract carload, 1" x D; packed, max 0.50% ton lot $1.05, less ton $1.07. Delivered. Spot, add 5c.

Vanadium Alloys

Ferrovanadium: Open-hearth Grade (Va 35-55%, Si 8-12% max., C 3-3.5% max.). Contract, any quantity, $2.90 per lb of contained Va. Delivered. Spot, add 10c. **Crucible-Special Grades** (Va 35-55%, Si 2-3.5% max., C 0.5-1% max.), $3. **Primos and High Speed Grades** (Va 35-55%, Si 1.50% max., C 0.20% max.) $3.10.

Grainal: Vanadium Grainal No. 1, 93c per lb; No. 6, 63c; No. 79, 45c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.20 per lb contained V_2O_5, freight allowed. Spot, add 5c.

Tungsten Alloys

Ferrotungsten: (70-80%). Contract, 10,000 lb W or more, $2.50 per lb of contained W; 2000 lb W to 10,000 lb W, $2.60; less than 2000 lb W, $2.72. Spot, add 2c.

Tungsten Powder: (W 98.8% min.). Contract or spot, 1000 lb or more, $3.40 per lb of contained W; less than 1000 lb W, $3.50.

Zirconium Alloys

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, Fe 40-45%, C 0.20% max.). Contract, c.l., lump, bulk 6.6c per lb of alloy, c.l. packed 7.35c, ton lot 8.1c, less ton 8.95c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Contract carload, lump, packed 20.25c per lb of alloy ton lot 21c, less ton 22.25c. Freight allowed. Spot, add 0.25c.

Boron Alloys

Ferroboron: (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Contract, 100 lb or more, 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices 100 lb and over are as follows: Grade A (10-14% B) 75c per pound; Grade B (14-18% B) $1.20; Grade C (19% min. B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $4.25 per lb contained B, f.o.b. Philo, O., with freight not to exceed railroad freight allowed to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%) contract, lump carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

Other Ferroalloys

Ferrocolumbium: (Cb 50-60%, Si 8% max., C 0.4% max.). Contract, ton lot, 2" x D, $3.50 per lb of contained Cb, less ton $3.55. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min., C 0.30 max.) ton lots, 2" x D, $2.67 per lb of contained Cb plus Ta, delivered; less ton lots $2.72.

CMSZ Mixes: (No. 4—Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3-4.5%; No. 5—Cr 50-56%, Mn 4-6%, Si 13.50-16.0%, Zr 0.75-1.25%, C 3.50-5%), 12 M x D, carload packed 19.0c per lb of material, ton lot 19.75c, less ton 21.0c. Delivered.

Silcaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed, 1" x D, 43c per lb of alloy, ton lot 45c, less ton 47c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Contract, carload, packed, ½" x 12 M, 16.5c per lb of alloy, ton lots 17.25c less ton 18.5c. Delivered. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 17.0c per lb of alloy; ton lots 18.0c; less ton lots 19.50c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed, 14.25c per lb of alloy; ton lots 15.75c; less ton lots 17.00c, f.o.b., Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al). Lump, bulk, carload 11.00c. Ton lots, bulk 11.50c, packed 11.75c. Less ton lots, packed 12.25c per lb of alloy, f.o.b. Philo, O., with freight not to exceed railroad freight allowed to destination.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base); carloads, f.o.b. seller's works, Mt. Pleasant, or Siglo, Tenn., $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb. contained Mo, f.o.b. Langeloth, $1.22; Washington, Pa., furnace, any quantity $1.13.

Technical Molybdic-Oxide: Per lb, contained Mo., f.o.b. Langeloth $1.04, packed in bags containing 20 lb of molybdenum; Washington, Pa., 95.00c.

NOTE: Prices on silicon, calcium, titanium and briquetted alloys appeared on page 214, Oct. 16 issue.

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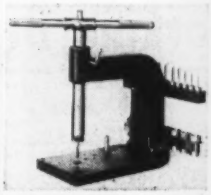

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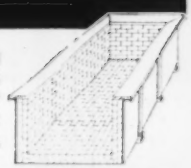

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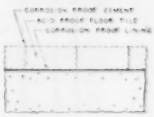

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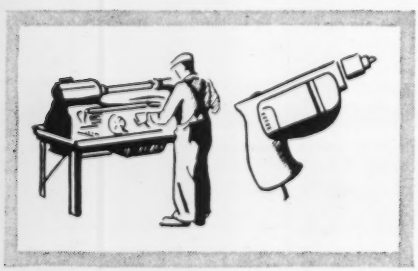

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Metalworking Briefs

CONSTRUCTION, ENTERPRISE
ORGANIZATIONAL CHANGES

Alabama

Southern States Iron Roofing Co., Birmingham, let contract to Brice Building Co., that city, for a warehouse and office building; estimated cost, $275,000.

California

Dow Chemical Co. plans a $1.5 million addition to its Great Western Division plant at Pittsburg, Calif. The expansion will increase output of caustic soda and chlorine 25 to 30 per cent. The company also is considering construction of a plastics plant in the Los Angeles area.

California

Clearprint Paper Co., manufacturer of blueprint and tracing paper, plans a 50 per cent expansion of its plant at Emeryville, Calif., at a cost of $160,000. Completion of the structure is scheduled for next spring.

California

General Metals Corp., Oakland, Calif., purchased Pacific Fittings Inc., a San Francisco producer of pipe fittings. By operating the firm in conjunction with General Metals' new malleable foundry, an integrated operation from raw materials to finished fittings will be obtained.

California

Challenge Mfg. Co., Los Angeles, started construction of a second plant, that city. The new facilities will be used for manufacture of ready-mixed concrete trucks and cargo trailers. Completion is scheduled by Dec. 1.

California

Southern California Edison Co., Los Angeles, will build a $30 million steam generating plant at Fontana, Calif. First of two 100,000-kw units will be completed in 1952, with the additional unit scheduled for construction later. Tentative orders for the first Fontana generating unit have been placed and contract for the station design is expected to be awarded this month. The plant will use natural gas and oil for fuel.

California

Precision Specialties Inc., Los Angeles, started construction of a plant in the new Los Angeles International Airport industrial tract. Architect is S. Charles Lee. Construction is by Hayden-Lee Corp., developer of the $15 million tract.

California

Construction started on **Imperial Irrigation District,** El Centro, Calif., unit No. 2 steam electric generating plant. Contract for $743,062 was awarded Fred J. Early Co. Inc., San Francisco.

Colorado

Berger Mfg. Division, **Republic Steel Corp.,** Cleveland, appointed Armstrong Equipment Supply Co. Inc., Denver, as its exclusive industrial sales agency in Colorado. R. W. Helms is Berger's general manager of sales, while J. P. Perito is president of the Armstrong company.

Delaware

A Wilmington office of the **Atomic Energy Commission** will open about Nov. 1 to coordinate its work with the DuPont company in the construction of a plant to produce materials for the H-bomb. After about one year in Wilmington, the commission offices will move to the site of the H-bomb plant.

Delaware

M. & S. Rental Equipment Co. Inc., machinery, materials and supplies—was chartered by the secretary of state's office, Dover, Del. Capital of the firm is listed at $200,000. Prentice-Hall Corporation System Inc., Dover, is serving as the principal office of the firm.

Illinois

Chicago locations of **Hewitt-Robins Inc.,** New York, will be consolidated at 402 W. Randolph St. Offices and warehouses of the Hewitt Rubber, Robins Conveyors and Robins Engineers Divisions will be located at the new address effective Oct. 30. Hewitt Restfoam will continue to maintain its office in the Furniture Mart. The enlarged warehouse space permits greater on-hand stock of hose, belting and other industrial rubber products. In addition, stocks of conveying and vibrating machinery items will be close at hand thereby offering better service for the midwest market.

Illinois

Headquarters of the Chemical Division, **Masonite Corp.,** were moved from New York to the home office in Chicago. Thomas M. O'Neil, who organized the division when it was established two years ago, will continue as its manager and, in addition, will handle the corporation's sales research. He formerly was supervisor of technical service and development for the Heyden Chemical Corp., New York.

Indiana

Skinner, Harlan & Ireland Inc. was organized as a consulting engineering firm with offices and laboratory in Indianapolis, Ind. The new firm will specialize in permanent magnets and soft magnetic materials, but will accept consulting projects in any allied field.

Maryland

Steel Specialties Inc., Baltimore, plans to erect a warehouse and office building at 4810 E. Monument St., that city.

Minnesota

Reltool Corp., Milwaukee, manufacturer of metal cutting tools, appointed Lyman B. Warren Co., St. Paul, as manufacturer's representative in upper Michigan, western Wisconsin, Minnesota, North Dakota and South Dakota, and Nebraska.

Missouri

Blanton Co., St. Louis, manufacturer of vegetable oils and products, awarded the general contract for an addition to its plant to the Willingham Construction Co., St. Louis. Gray & Auer, that city, are the architects and engineers.

Missouri

Rodgers Electric Co., Affton, Mo., manufacturer of thermostatic controls, awarded the general construction contract for a factory building to C. Ralle Contracting Co., 5000 Kemper Ct., St. Louis. Previously, the contracts for the fabrication and erection of the structural steel were

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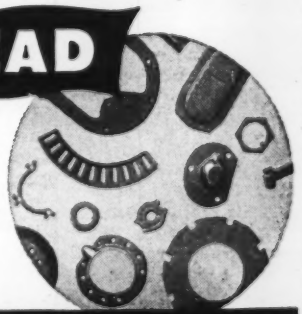

For 46 years, Whitehead has been a recognized source of economical, accurate, and dependable stampings. Send your blueprint for an estimate.

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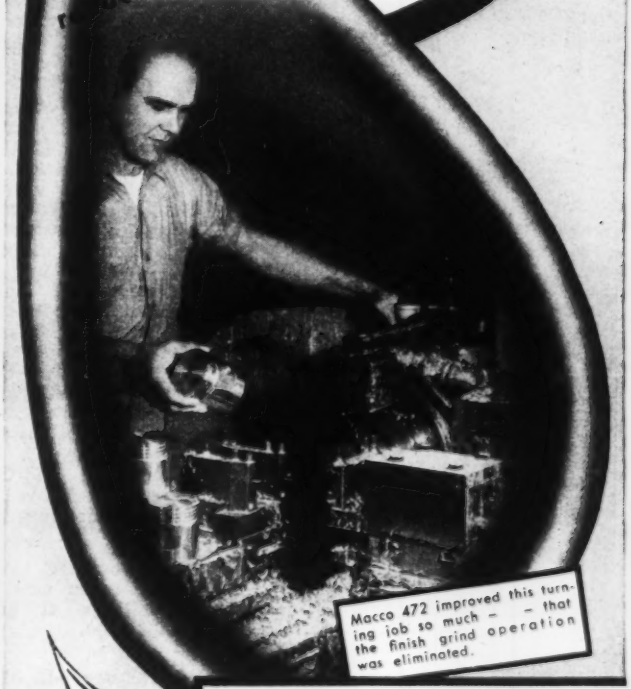

Macco 472 improved this turning job so much — — that the finish grind operation was eliminated.

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The unusually high film strength of Macco 472 is the reason why it produces almost unbelievable increases in tool life — job after job, metal after metal.

That's why Macco 472 is flatly guaranteed to show at least a 25% increase in tool life over any other water soluble lubricant for sale.

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The quickest way to find out what Macco 472 will do for you is — to test it yourself in your plant. Macco 472 will produce outstanding results for you, too — regardless of the machines you have . . . the cutting tools you use . . . or . . . the metal you process.

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